MARCH 11, 1933

Railway Age

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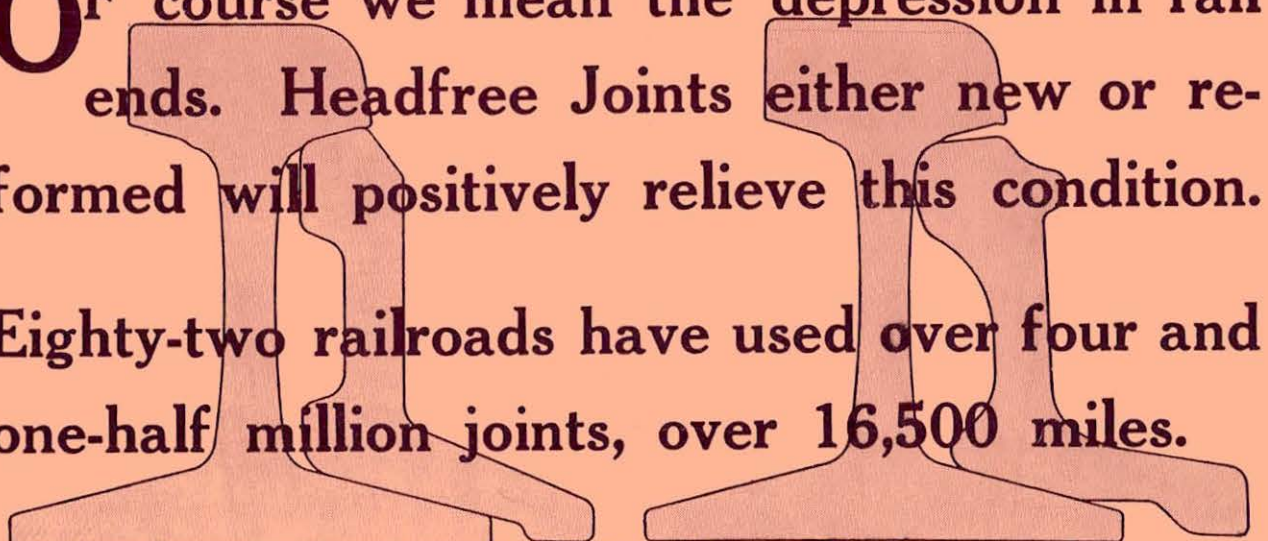

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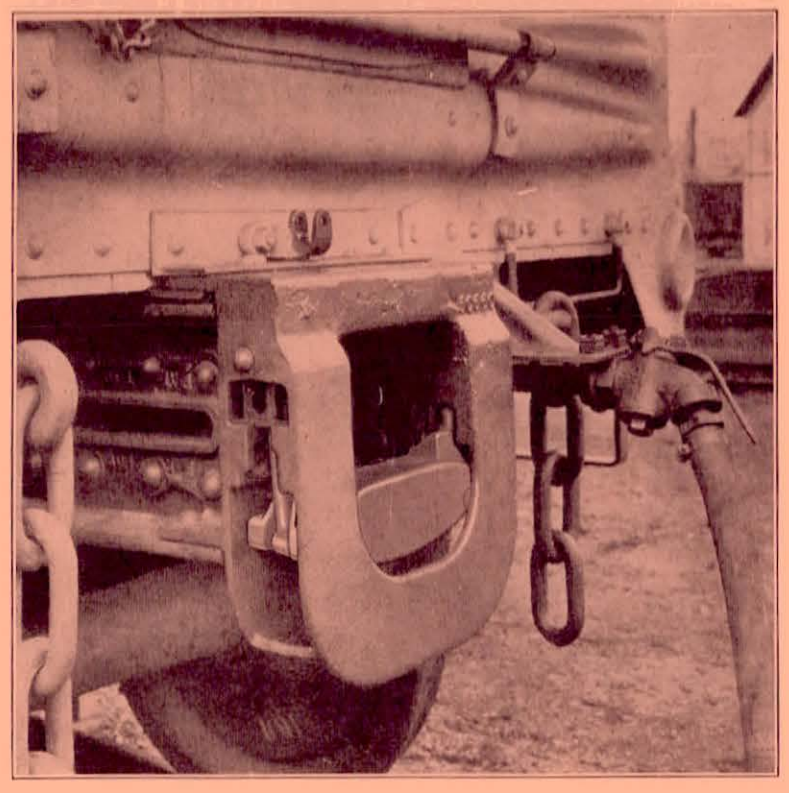

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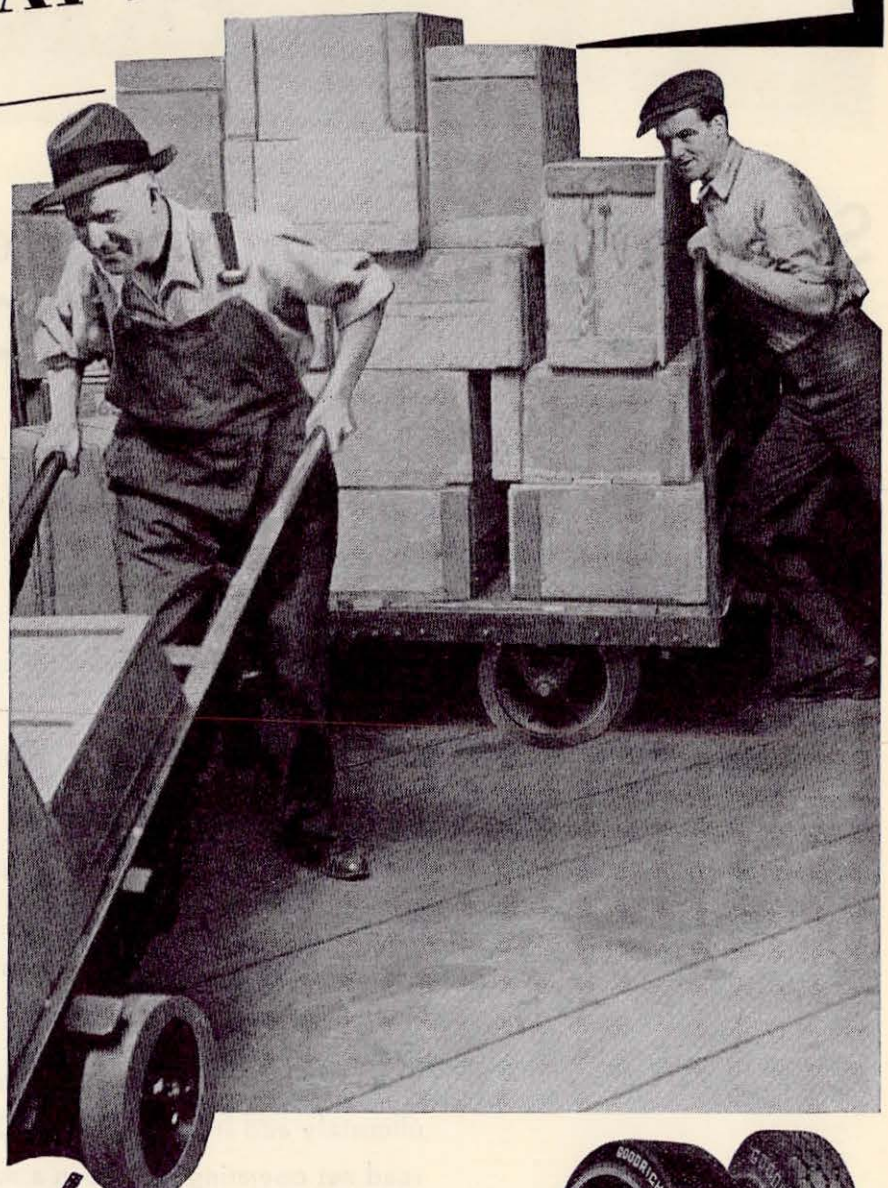
Same Men...Same Trucks BUT WHAT A DIFFERENCE!



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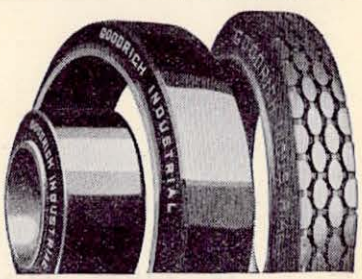

Goodrich *Industrial* Tires

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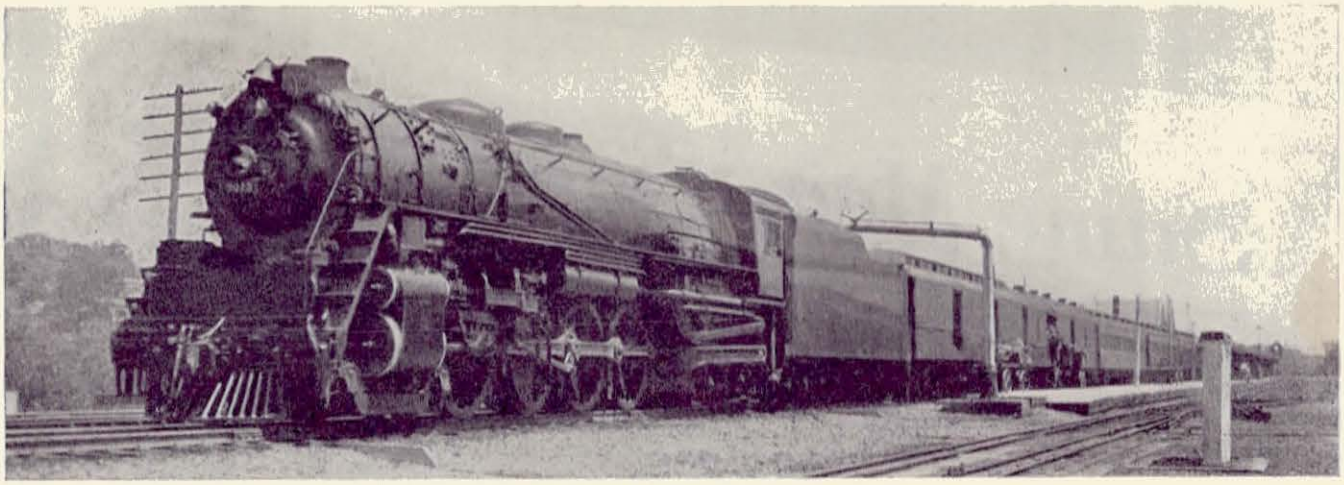

Systematic Locomotive Replacement= Controlled Operating Cost

Last week we spoke about the replacement of obsolete power as a means of realizing immediate savings in operating expense. Let us go further.

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PHILADELPHIA

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Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

Vol. 94 March 11, 1933 No. 10

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This article, the second of a series of three on railway research, tells how nearly all phases of railroad operations have been influenced in some measure by the results of scientific investigations.

Operation of Three-Power Locomotives **363**

An article in which F. H. Craton, of the transportation engineering department, General Electric Company, Erie, Pa., points out how the D., L. & W. has found this type of motive power, which offers the equivalent of complete terminal electrification, suitable for both switching and transfer service.

The Economic Selection, Treatment and Use of Cross Ties **367**

D. C. Curtis, chief purchasing officer, Chicago, Milwaukee, St. Paul & Pacific, discusses the importance of systematic purchasing and handling of each species.

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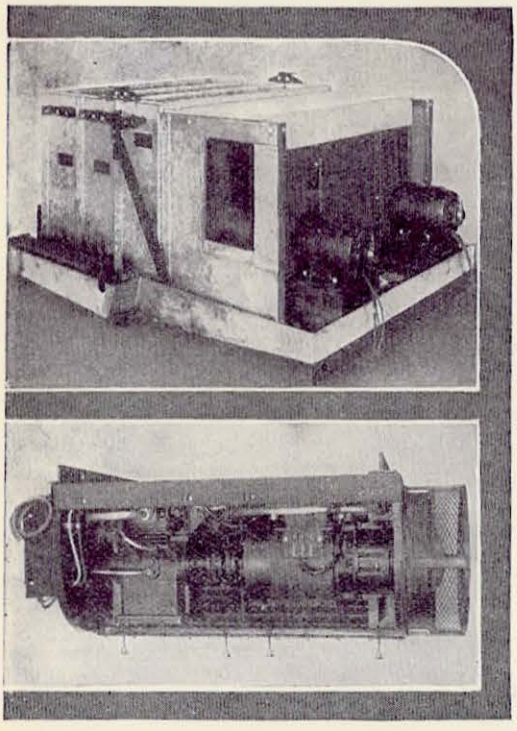

AIR CONDITIONING This unit cools, dehumidifies and ventilates. Easy installation is assured because all apparatus is assembled at the factory ready for mounting in the car roof.

REFRIGERATING This compact unit mounted under the car floor is enclosed in a single box. Its high-speed 6-ton compressor has ample capacity to provide forced dehumidification. The a-c.--d-c. motor solves the problem of pre-cooling cars at terminals prior to departure. All parts are accessible for inspection by removing the hinged side and bottom of the box.

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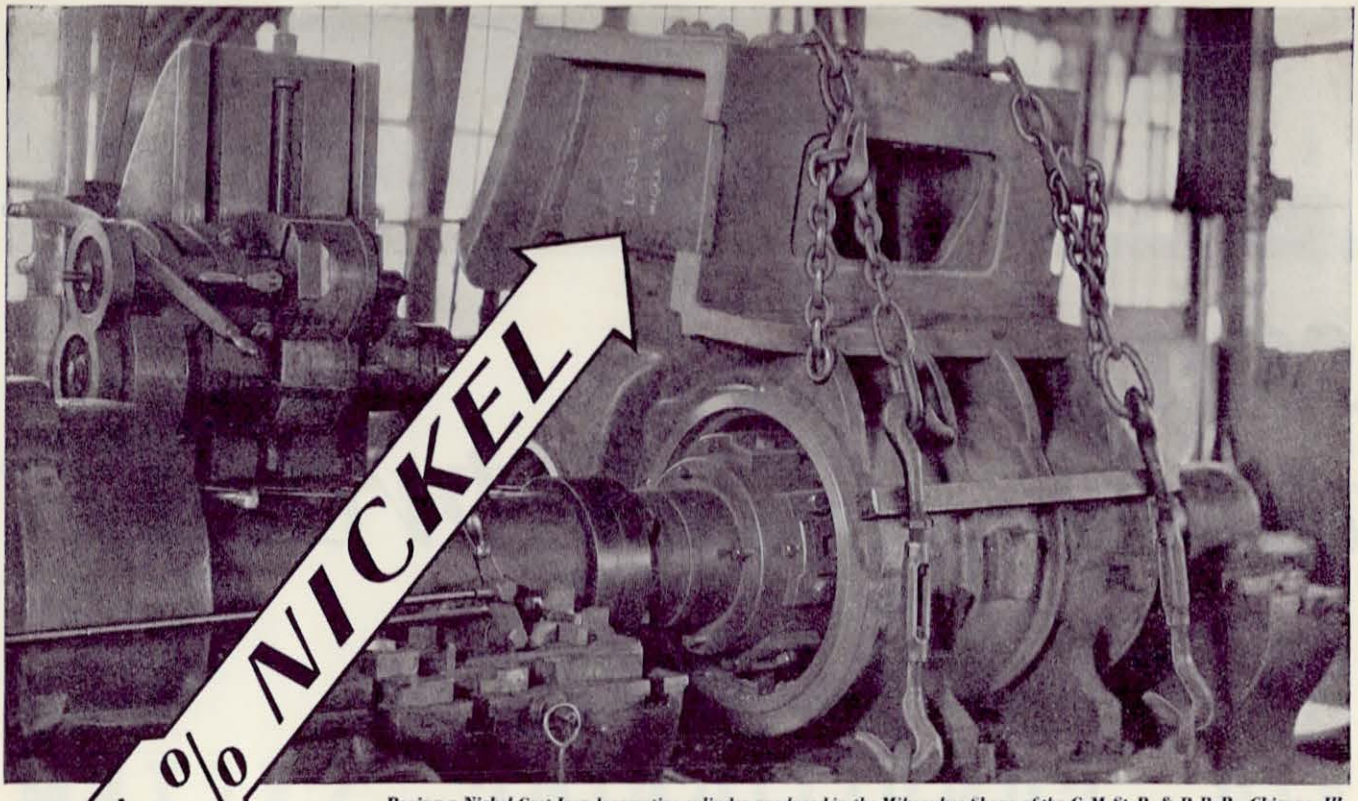
EQUIPMENT — FROM RAIL TO ROOF



Boring a Nickel Cast Iron locomotive cylinder produced in the Milwaukee Shops of the C. M. St. P. & P. R. R., Chicago, Ill.

. . . makes locomotive cylinder castings perform better longer

● As a result of several years experience with this modern alloy, the Chicago, Milwaukee, St. Paul and Pacific Railroad Co. now knows that Nickel Cast Iron "performs better longer". One hundred and fifty-two locomotive cylinder castings averaging 8,870 lbs. each have been produced in the Milwaukee shops from Nickel Cast Iron. ● Laboratory tests of Nickel Cast Iron produced from a special base mixture containing approximately 0.75% Nickel show higher tensile strength and Brinell hardness. Finished castings are readily machined to a high finish due to the finer grain. Other well known features of Nickel Cast Iron are a minimum of free carbide as well as a fully pearlitic ground mass containing finely divided and uniformly distributed graphite—characteristics essential to longer wearing locomotive parts.

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More than 5 million car miles of successful operating experience on various types of passenger-carrying cars on several different railroads have proved **PC&MC** installations the best the market affords today on both major counts — *operating economy* and *mechanical dependability*.

These facts are worthy of every railway executive's thorough consideration. Car mile costs are vital. May we show you why **PC&MC** AIR CONDITIONING equipment offers a better financial return on your investment than any other system?

PC&MC OPERATING ADVANTAGES

1 The **PC&MC** system has fewer moving parts, which assures dependable simplicity.

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For the Interpretation of Railroad Statistics You Should Have a Copy—

Analysis of Railroad Operations

By J. L. WHITE

Vice-President, Irving Investors Management Company, Inc.; formerly Assistant Comptroller, United States Railroad Administration

This book describes how accounting department figures should be used in the study of railroad operating results. A four page sample work sheet is furnished for setting down basic statistics and significant averages of a railroad over a given period. The author shows how these figures reflect the various activities of a railroad, the operating efficiency of the road as a whole or of any of its departments. Classifications of the Interstate Commerce Commission are given in full in the appendix and frequent and detailed references are made to them in the text.

Statisticians and the statistical departments of financial houses dealing in railroad securities can with the aid of this book make a more careful analysis of the earning power of individual roads and of the actual value of their stocks and bonds.

Accountants will find the vast fund of information contained in railroad accounting records and statistics made more available and understandable.

Students of railroad operations without accountancy training will be more able to understand railroad financial reports, as the author stresses interpretation rather than preparation of accounting statistics.

Contents

The Income Statement—Railway Operating Revenues—Statistics of Freight and Passenger Service—Analysis of Fluctuations in Operating Revenues—Railway Operating Expenses—Analysis of Fluctuation in Railway Operating Expenses—Analysis of Fluctuations in Maintenance of Way and Structures Expenses—Unit Costs of Maintaining Fixed Property—Analysis of Fluctuations in Maintenance of Equipment Expenses—Analysis of Account 314—Freight Train Cars—Repairs—Unit Costs of Maintaining Equipment—Analysis of Fluctuations in Transportation Expenses—Statistics of Operation Used as Bases for Unit Costs—Analysis of Fluctuations in the Revenue Train Load in Freight Service—Analysis of Fluctuations in Traffic and General Expenses—Analysis of Railroad Operations Based on Data in Annual Report to the Interstate Commerce Commission—Appendices, including the Interstate Commerce Commission accounting classifications.

373 pages, 6 x 9 inches, index, $4.00

REGULATION OF RAILROAD FINANCE

By John H. Frederick, Ph.D., Frank T. Hypps, Ph.D., and James M. Herring, Ph.D.

Instructors in the Wharton School of Finance and Commerce; University of Pennsylvania

Regulation of the financial affairs of railroads by the Federal government through the Interstate Commerce Commission, under the Transportation Act of 1920, is clearly explained in this book. The various tests applied by the Commission in determining the elements of public interest to which the statute usually refers are traced, together with the nature and reasons for the Commission's action in regulating the financial affairs of the railroads.

Contents

Introduction—Certificates of Public Convenience and Necessity for Construction and Abandonment of Railroads—The Acquisition of Control of Carriers—The Recapture of Excess Earnings—The Issuance of Securities and Assumption of Obligations—Interlocking Directorates—Appendices: Provisions of the Interstate Commerce Act Administered by the Finance Bureau of the Interstate Commerce Commission—New Railroad Construction—Abandonments—Bibliography—Index.

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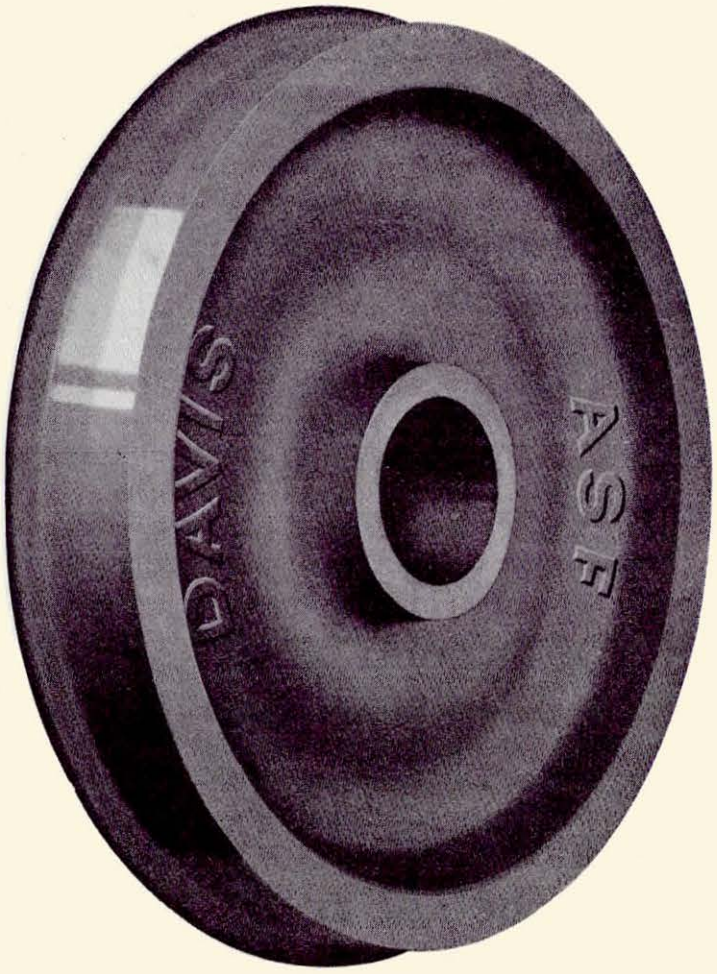


A wheel designed for use in passenger and tender service where wheels are worked hard, pushed to the very limit and where safety and dependability are of the utmost importance.

It will pay to investigate thoroughly this type of wheel as an efficient aid to heavy high speed transportation.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

A standard car is economical.

Then why not a standard roof?

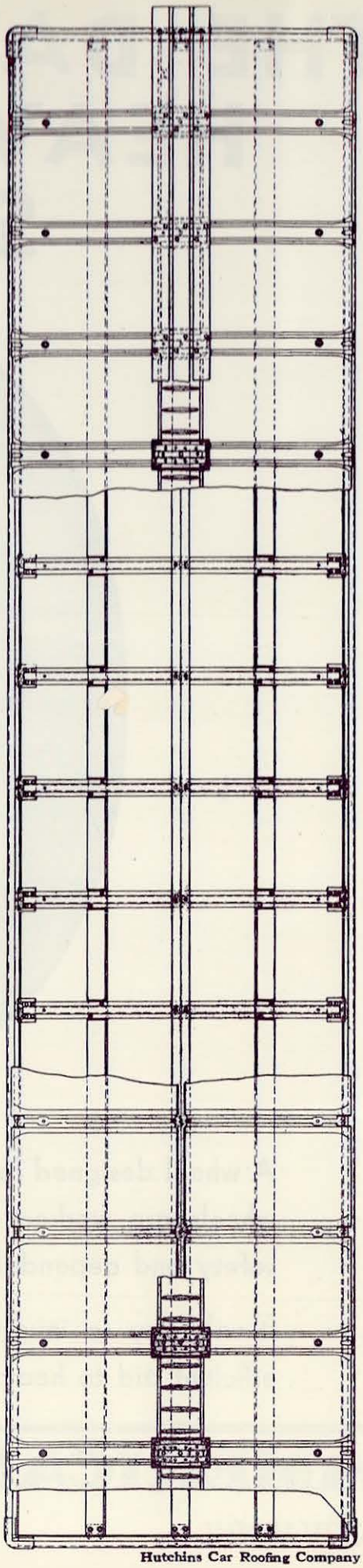
A riveted roof is certainly not a standard roof. (*It is standard only for the size and design of car for which it was made.*)

A standard roof must be a roof that has one size and one design parts that will fit any and all new cars of any size and design, also all existing cars operating on standard gage tracks.

The UNIVERSAL DRY LADING ALL STEEL ROOF is such a roof —it has one size and one design parts and is adjustable.

Some have a mistaken idea that a Riveted roof holds the car frame the strongest and most rigid. Figure it out for yourself. You will find that it is really the Universal roof, it has longitudinal members (not found in any riveted roof). Plan view shows why—it is patterned after the underframe of a car.

Inspection of cars shows Universal roofs are outwearing Riveted roofs respectively one to two.



Hutchins Car Roofing Company

Unwarranted Government Expenditures — A Highway Example

The banking situation which has developed in the United States within the last few weeks, and reached a climax with the general closing of the banks, should do more to improve business than all the measures which have been adopted to improve business since the depression began more than three years ago.

Ever since the brief depression of 1921-1922 the American people, both in their business and private lives and in the conduct of their public affairs, have been disregarding almost every economic principle which experience had shown to be sound. They indulged during the years of so-called prosperity in an orgy of misuse of government and private credit and of reckless speculation and unsound government and private expenditure. They have tried throughout the depression to use government credit, bolstered up by increased taxation, to stimulate business and employment, when what has been needed has been cessation of the misuse of credit, a drastic reduction of national, state and local government expenditures and retrenchment in business and private expenditures in accordance with general conditions. While we have been using government credit and taxation to bolster up business and banking, many of the people have been going to the banks and drawing out and hoarding their money, with the result that the loaning of government money to the banks and other corporations and institutions has finally proved about as effective as pouring water into a rat hole.

Public men, business men and the people are at last face to face with realities. Banking moratoriums will interfere temporarily with the ordinary and orderly conduct of business; but they will also strengthen the entire financial structure by preventing withdrawal of deposits, which, if continued, would finally have ruined every bank in the country, regardless of all the loans the Reconstruction Finance Corporation could have made. The drastic measures for the protection of the banks which have been adopted will at last give public men, business men and the people generally an opportunity to think and rechart their course.

Two-Thirds of State Debts Due to Highway Expenditures

No man with any knowledge of economics and a reasoning mind can review what has occurred within the last decade, and especially during the depression, and feel any surprise at the climax in the nation's affairs which occurred just when a change of national administrations was occurring. No such condition as now exists in the United States ever was precipitated by few and unimportant causes. Numerous causes of it could be cited. Among the most important have been vast and reckless increases in government expenditures financed largely by misuse of government credit. If we are to restore production, commerce and employment to normal we must replace the unsound policies which heretofore have been followed with sound policies. The unsound policies which have been followed and are still being advocated must be specifically discussed, condemned and abandoned if a substantial improvement in conditions is to be secured.

Because it is of especial concern to the railways, both as taxpayers and as carriers of freight and passengers, the *Railway Age* again calls attention to the highway policies that have been and still are being followed as among the principal causes of the overexpansion of government credit and government expenditures which are largely responsible for the present economic and financial crisis. To these highway expenditures alone are due almost *two-thirds* of the present aggregate indebtedness of all the states in the union. A single cause of such a vast increase of government indebtedness and expenditures raises economic questions too important to be ignored when, as is actually the case, propaganda is being industriously carried on to keep that cause in operation.

Building Highways for Trucks

The National Automobile Chamber of Commerce recently has distributed as a part of its "motor truck educational campaign" an article by Willard Chevalier, publishing director of the Engineering News-Record, entitled "Federal Highway Aid: What It Saves For The American Taxpayer." The article advocates a continuance of appropriations by Congress in aid of highway construction by the states upon the ground that "the actual mileage of new highways provided through federal aid appropriations is but a fraction of the value received and that the direct cash savings realized from more intelligent, comprehensive and businesslike highway administration all along the line are worth more than its cost."

The money appropriated by Congress for federal highway aid has been spent under the direction of the Bureau of Public Roads of the Department of Agriculture. Thomas H. MacDonald is chief of the Bureau of Public Roads. Mr. MacDonald said in an article which appeared in the April, 1932, issue of the Scientific American, "We are not investing the large sums we are pouring into this newest of the great works of internal improvement simply to provide pleasure roads for motorists. * * * It is commerce as well as personal travel that we are providing for. * * * It is absolutely necessary that we build for trucks as well as for automobiles." Federal aid is restricted to seven

Using a Pyrometer in the Heat Treatment of a Rail End

Railroads Profit from Research*

Nearly all phases of their operations have been influenced in some measure by the results of scientific investigations

THERE is hardly a phase of railway transportation that has not felt the magic touch of research. It is true that much of the research from which the railways have derived great benefit was performed by others, for example, the manufacturers of locomotives, signaling equipment and of many other appliances and materials used by the carriers. However, the extent of the research work in which the railways are themselves participating and the volume of scientific investigation that is being conducted and financed by them directly are far greater than is commonly realized. Nor is it generally appreciated that advance in such applied sciences as water treatment and wood preservation, from which industry and the individual householder are now enjoying appreciable benefits, is due in large part to pioneer work carried on by the railways for years before these important developments were given more than casual attention by others who could have profited therefrom.

Not of a Spectacular Nature

In the main, however, research fostered by the railways has been directed into channels in which they alone have had a direct concern, and by the same token, the gains realized have been of interest to them only. Being largely of a technical character, the resulting advances in theory and practice have not been of such a nature as to command front-page notice in the newspapers. It is not surprising, therefore, that the layman does not know that research financed by the American Railway Association evolved a device with which the roads are now detecting interior fissures and flaws in rails that even a microscopic examination of the exterior will not disclose.

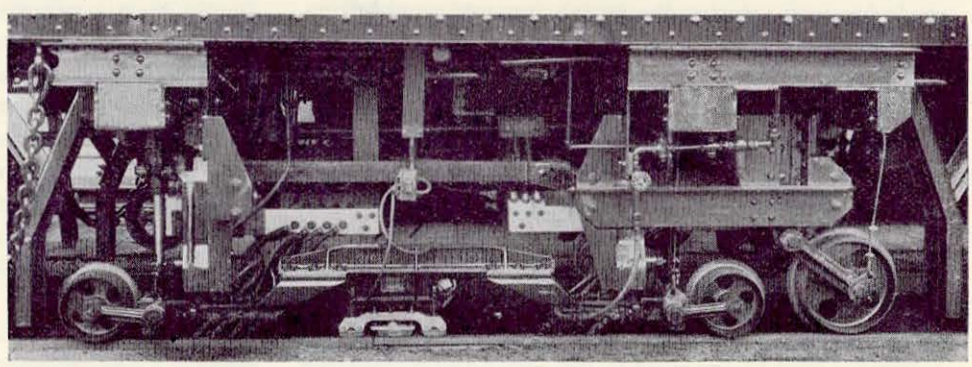
But compared with this appliance, the great mass of the scientific investigations carried on by the railways is decidedly prosaic. Take the track, for example, consisting of two rails on a grid of crossties embedded in ballast. It is entirely too simple a device to kindle the imagination of the man on the street. Yet for nearly 20 years, thousands of dollars have been spent annually in studying the properties and behavior of its component parts. Some of this investigation has had to do with service tests of concrete and steel ties and with the construction and use of a reinforced concrete roadbed on the Pere Marquette near Detroit, Mich., but because most research in track has had to do with conventional designs, and because the studies made have not given rise to any drastic change in design, the public has heard nothing about it.

Research on Track Stresses

It is a fact, however, that since 1913 an organization known as the Special Committee on Stresses in Track has been at work on an investigation financed by the American Railway Association. Considering the simplicity of its elements, it would seem that the principles of engineering involved in track design would be correspondingly elemental. On the contrary one of the first results of this study was to disclose the intricate nature of the problem presented and to show that the development of the facts necessary for an accurate knowledge of the behavior of track in service would have to do mainly with field tests and only to a minor extent with laboratory work.

Accordingly, this investigation, conducted under the direction of Dr. A. N. Talbot of the University of Illinois, has required the taking of a vast amount of data on the stresses in rails and the deformation of the rails and other parts of the track under the wheels of trains. This information has been collected on many pieces of track in various parts of the country under hundreds of regular trains and thousands of test runs of locomotives and cars, especially assigned to these test operations. The analysis of the data thus gathered has

* This is the second of three articles on railway research and cooperative action, the first of which appeared in the issue of February 18, page 251.



The Rail Contact and Brushes of a Rail-Flaw Detector Car

Unwarranted Government Expenditures — A Highway Example

The banking situation which has developed in the United States within the last few weeks, and reached a climax with the general closing of the banks, should do more to improve business than all the measures which have been adopted to improve business since the depression began more than three years ago.

Ever since the brief depression of 1921-1922 the American people, both in their business and private lives and in the conduct of their public affairs, have been disregarding almost every economic principle which experience had shown to be sound. They indulged during the years of so-called prosperity in an orgy of misuse of government and private credit and of reckless speculation and unsound government and private expenditure. They have tried throughout the depression to use government credit, bolstered up by increased taxation, to stimulate business and employment, when what has been needed has been cessation of the misuse of credit, a drastic reduction of national, state and local government expenditures and retrenchment in business and private expenditures in accordance with general conditions. While we have been using government credit and taxation to bolster up business and banking, many of the people have been going to the banks and drawing out and hoarding their money, with the result that the loaning of government money to the banks and other corporations and institutions has finally proved about as effective as pouring water into a rat hole.

Public men, business men and the people are at last face to face with realities. Banking moratoriums will interfere temporarily with the ordinary and orderly conduct of business; but they will also strengthen the entire financial structure by preventing withdrawal of deposits, which, if continued, would finally have ruined every bank in the country, regardless of all the loans the Reconstruction Finance Corporation could have made. The drastic measures for the protection of the banks which have been adopted will at last give public men, business men and the people generally an opportunity to think and rechart their course.

Two-Thirds of State Debts Due to Highway Expenditures

No man with any knowledge of economics and a reasoning mind can review what has occurred within the last decade, and especially during the depression, and feel any surprise at the climax in the nation's affairs which occurred just when a change of national administrations was occurring. No such condition as now exists in the United States ever was precipitated by few and unimportant causes. Numerous causes of it could be cited. Among the most important have been vast and reckless increases in government expenditures financed largely by misuse of government credit. If we are to restore production, commerce and employment to normal we must replace the unsound policies which heretofore have been followed with sound policies. The unsound policies which have been followed and are still being advocated must be specifically discussed, condemned and abandoned if a substantial improvement in conditions is to be secured.

Because it is of especial concern to the railways, both as taxpayers and as carriers of freight and passengers, the *Railway Age* again calls attention to the highway policies that have been and still are being followed as among the principal causes of the over-expansion of government credit and government expenditures which are largely responsible for the present economic and financial crisis. To these highway expenditures alone are due almost *two-thirds* of the present aggregate indebtedness of all the states in the union. A single cause of such a vast increase of government indebtedness and expenditures raises economic questions too important to be ignored when, as is actually the case, propaganda is being industriously carried on to keep that cause in operation.

Building Highways for Trucks

The National Automobile Chamber of Commerce recently has distributed as a part of its "motor truck educational campaign" an article by Willard Chevalier, publishing director of the Engineering News-Record, entitled "Federal Highway Aid: What It Saves For The American Taxpayer." The article advocates a continuance of appropriations by Congress in aid of highway construction by the states upon the ground that "the actual mileage of new highways provided through federal aid appropriations is but a fraction of the value received and that the direct cash savings realized from more intelligent, comprehensive and businesslike highway administration all along the line are worth more than its cost."

The money appropriated by Congress for federal highway aid has been spent under the direction of the Bureau of Public Roads of the Department of Agriculture. Thomas H. MacDonald is chief of the Bureau of Public Roads. Mr. MacDonald said in an article which appeared in the April, 1932, issue of the Scientific American, "We are not investing the large sums we are pouring into this newest of the great works of internal improvement simply to provide pleasure roads for motorists. * * * It is commerce as well as personal travel that we are providing for. * * * It is absolutely necessary that we build for trucks as well as for automobiles." Federal aid is restricted to seven

per cent of the highways of each state, and provides for 50 per cent of the expenditure made upon this part of the highways, the other 50 per cent being provided for by the state. The Bureau of Public Roads, however, virtually dictates the kind of highways that shall be built with the aid of federal appropriations. This means, therefore, that highways which the federal government helps to build must be built "for trucks as well as for automobiles."

Excess Cost of Truck Highways

A more expensive highway is required for heavy buses and trucks than for automobiles and light trucks. Where traffic requires hard-surface pavements, a thickness of 5 in. of concrete is sufficient for private automobiles and light trucks, such as the farmer uses. An inventory of 17,730 miles of concrete roads now in existence in nine Mississippi valley states shows that only 18 miles have an average thickness of less than 5 in., that 3,605 miles have an average thickness of 5½ to 6 in., and that 14,117 miles have an average thickness in excess of 6 in. In an article published in the Journal of Land and Public Utility Economics in October, 1925, Mr. MacDonald said that it would require a pavement two inches thicker to provide for heavy truck traffic than for ordinary automobile and light truck traffic, and that this additional thickness would cost $10,000 a mile. Based on Mr. MacDonald's own estimate, the excess of the cost of the 17,730 miles of concrete roads in the nine Mississippi valley states referred to over what they would have cost if built only for the use of automobiles and light trucks has averaged $9,000 a mile and totaled almost $160,000,000.

There were 60,348 miles of concrete roads in the state highway systems of the United States at the end of 1931. If the excess expenditure upon them to provide for heavy truck traffic had averaged as much per mile as in the nine Mississippi valley states, the total excess expenditure made upon the state highway systems to provide for heavy truck traffic had been more than $600,000,000. These figures take no account of excess expenditures made to provide extra width of road to accommodate truck traffic, or of 14,656 miles of concrete road in local systems at the end of 1930, for which information on thickness is unavailable.

Public and Private Use of Highways

There is no resemblance, from the standpoint of public policy, between expenditures made to provide highways for automobiles, and expenditures made to provide them for heavy commercial buses and trucks. The use of a highway by an automobile or a farmer's or merchant's light truck is an ordinary public use. Its use by the operator of a heavy bus or truck who engages in transportation for hire is a private use for private profit. Obviously, therefore, either highway expenditures especially for truck transportation should not be made, or those who use the highways for commercial transportation should be required to pay rentals or tolls which in the aggregate will fully reimburse the public for all the costs incurred by it in providing them with public property on which to carry on their private business. Are they paying such adequate aggregate rentals or tolls now? Is it economically possible for them to pay adequate rentals or tolls now? If not, will it ever be? If it never will be, is not the nation's present highway policy, which is being carried out under the virtual dictation of the Bureau of Public Roads—a dictation made possible by federal aid highway appropriations—a gigantic economic mistake and should not federal aid highway appropriations, and the virtual dictation of state highway policy by the Bureau of Public Roads, be discontinued?

Formulas have been developed by Charles E. Marvin, Jr., mechanical engineer of the United States Bureau of Standards, for allocating the costs of providing and maintaining highways between the light, medium and heavy vehicles that use them. The most complete inventory of the commercial trucks in any state that we have been able to obtain is an inventory of such vehicles in Kansas. How much in rentals are commercial trucks paying in Kansas for the use of the highways, and how much should they be paying? Approximate answers to these questions regarding what is and what should be occurring in one state must indicate what is and should be occurring in other states.

What Trucks Pay and Should Pay in Kansas

First, we must estimate the *annual current cost* of the highways of Kansas. The latest figures available which make possible such an estimate are for the year 1930. Some of these figures are as follows: maintenance, state highways, $2,980,786; maintenance, local roads, $5,026,492; highway equipment and machinery, $1,228,584; miscellaneous, $2,350,192; other obligations assumed, $120,454; interest on outstanding bonds, $933,960; depreciation (based on 20-year life of 1,022 miles of hard-surfaced pavements costing an average of $25,000 per mile) $1,277,000. These figures total $13,917,468. The investment in Kansas highways in 1930 was about $245,000,000, and directly or indirectly interest was being paid on this investment by somebody. If operators of commercial vehicles provided their own highways they would have to pay interest and taxes upon investment. Interest at 4½ per cent and taxes at one per cent upon the investment in Kansas highways would have amounted annually to at least $13,475,000. Therefore, the total annual cost of Kansas highways in 1930, affording a basis for estimating what commercial vehicles should have paid for their use, was about $27,400,000.

The accompanying table gives estimates of what commercial trucks did pay for the use of Kansas highways in the year ended June 30, 1932, and estimates based upon the Marvin formulas as to what they would have paid if they had paid enough in the aggregate to have fully reimbursed the taxpayers, on an annual basis, for the excess costs incurred by them in making the highways in existence in 1930 suitable for truck transportation. The most significant figures are those given in columns (6) and (8). These figures indicate

that the vehicle license fees, gasoline taxes and ton-mile taxes paid by owners of trucks weighing one ton or less totaled an average of $44 per vehicle, and should have averaged only $40. All the other figures indicate that owners and operators of trucks of a capacity of 1½ tons or more paid less than they should have. As the capacity of trucks increases the contrasts between the estimates of what they did pay and what they should have paid become positively fantastic. The operator of a 2½-ton truck, for example, paid about $101, and should have paid $1,400! The operator of a 5-ton truck paid about $246, and should have paid about $5,500! The aggregate paid by all operators of truck of capacities exceeding one ton should have been $1,975,000, and was only $327,000, or less than 17 per cent of what it should have been!

Highway Costs and Rentals for Commercial Truck Transportation in Kansas, Year Ended June 30, 1932

Capacity of Trucks (1)	Number (2)	Actual or Estimated Payments Per Vehicle: License Fees (3)	Gasoline Tax (4)	Ton Mile Tax (5)	Total (6)	Estimated Total Payments, or Rentals (7)	Estimated Rentals That Should Have Been Paid: Per Vehicle (8)	Total (9)
1 ton and less	992	$10.00	$20.00	$14.00	$44.00	$43,648	$40	$39,680
1½ tons	3,604	15.00	24.00	19.20	58.20	209,753	125	450,500
2 tons	546	30.00	26.66	26.40	83.06	45,351	600	327,600
2½ tons	234	37.50	30.00	33.20	100.70	23,564	1,400	327,600
3 tons	291	45.00	32.00	38.80	115.80	33,698	2,000	582,000
3½ tons	30	70.00	34.29	44.00	148.29	4,449	2,800	84,000
4 tons	25	100.00	40.00	48.80	188.80	4,720	3,500	87,500
5 tons and over	21	140.00	48.00	58.00	246.00	5,166	5,500	115,500
Total,	5,743					$370,349		$2,014,380

Heavy Trucks Never Can Pay Adequately for Use of Highways

Is there anything wrong with the figures? The trouble is not with the figures, but with the fundamental fact which they demonstrate. This fundamental fact is that the policy which the federal and state governments have been following under the dictation of the United States Bureau of Public Roads in building highways for trucks is absolutely unsound economically, because it is resulting in *excess* highway investment and maintenance for truck transportation so great that the taxpayers whose money is being invested can never possibly get a return upon it. Commercial highway vehicles can pay and should be compelled to pay much more for the use of highways than they are now paying, but the figures for Kansas show, and corresponding figures for any other state will show, that if an attempt were made to charge commercial vehicles rentals high enough to yield the taxpaying public an adequate return upon the highway investment it has made for such vehicles, the rentals imposed would drive practically all trucks of more than 2 tons capacity off the highways excepting for short hauls.

The public and those who tax it and spend its money are, then, confronted with a choice between two policies. First, they can continue to provide, as they are now providing, highways to be used by both light and heavy motor vehicles. If they continue this policy they will necessarily continue to subsidize truck transportation at the cost of the taxpayers, because they will never be able to charge heavy trucks enough fully to reimburse the taxpayers for the expenditure required to provide highways strong and wide enough for trucks. Second, the public and those who tax it and spend its money can abandon the present policy of constructing highways for both heavy and light vehicles and adopt the policy of constructing them only for light vehicles. This is the only economically sane thing to do. Why should the public continue to tax itself to spend $9,000 a mile or more upon highways in excess of what is required to construct them for automobiles and light trucks when the facts show that heavy vehicles never can pay enough for the use of the highways to justify the excess cost of constructing highways for them?

The *Railway Age* challenges the statement of Thomas H. MacDonald, chief of the Bureau of Public Roads, that "it is absolutely necessary that we build for trucks as well as for automobiles." We assert that that policy, as dictated to the states by the Bureau of Public Roads by the use of federal highway aid appropriations as a club, is economically unsound from every standpoint, and that therefore the club should be withdrawn by the discontinuance of federal aid highway appropriations. The policy being followed is economically unsound because the railways afford adequate, satisfactory and the most economical means of transportation, excepting for short hauls that can be made with light trucks. It is unsound from the standpoint of the public as taxpayers because it imposes upon the public heavy and increasing taxes to subsidize truck transportation which is not and never can be self-supporting. It is unsound from the standpoint of the public as users of railway service because it is helping cause a diversion of traffic from the railways which tends to make necessary higher railway rates than otherwise would be necessary.

The public already has piled upon its own back a load of taxes to provide highways for trucks which it cannot afford to bear. A continuance of the highway policy dictated by the Bureau of Public Roads would simply be a continuance of one of those policies of wildly extravagant government expenditure for which there never was and never can be any economic justification, and which are largely responsible for the economic plight in which the American people now find themselves. It is significant that the propaganda for continuance of excessive expenditures upon the highways is being disseminated as part of a "motor truck educational campaign." It is being backed by both the highway construction interests and the motor truck manufacturing interests, and their selfish interests are obvious. They are not interests that are consistent with the interest of the overburdened American taxpayer.

Using a Pyrometer in the Heat Treatment of a Rail End

Railroads Profit from Research*

Nearly all phases of their operations have been influenced in some measure by the results of scientific investigations

THERE is hardly a phase of railway transportation that has not felt the magic touch of research. It is true that much of the research from which the railways have derived great benefit was performed by others, for example, the manufacturers of locomotives, signaling equipment and of many other appliances and materials used by the carriers. However, the extent of the research work in which the railways are themselves participating and the volume of scientific investigation that is being conducted and financed by them directly are far greater than is commonly realized. Nor is it generally appreciated that advance in such applied sciences as water treatment and wood preservation, from which industry and the individual householder are now enjoying appreciable benefits, is due in large part to pioneer work carried on by the railways for years before these important developments were given more than casual attention by others who could have profited therefrom.

Not of a Spectacular Nature

In the main, however, research fostered by the railways has been directed into channels in which they alone have had a direct concern, and by the same token, the gains realized have been of interest to them only. Being largely of a technical character, the resulting advances in theory and practice have not been of such a nature as to command front-page notice in the newspapers. It is not surprising, therefore, that the layman does not know that research financed by the American Railway Association evolved a device with which the roads are now detecting interior fissures and flaws in rails that even a microscopic examination of the exterior will not disclose.

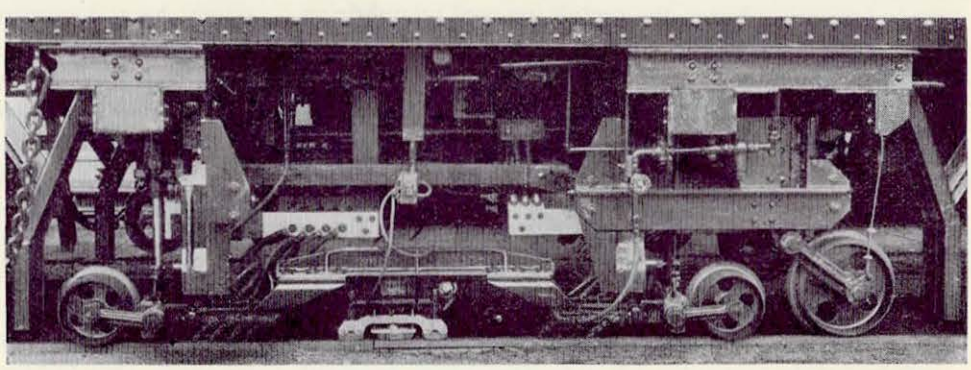
But compared with this appliance, the great mass of the scientific investigations carried on by the railways is decidedly prosaic. Take the track, for example, consisting of two rails on a grid of crossties embedded in ballast. It is entirely too simple a device to kindle the imagination of the man on the street. Yet for nearly 20 years, thousands of dollars have been spent annually in studying the properties and behavior of its component parts. Some of this investigation has had to do with service tests of concrete and steel ties and with the construction and use of a reinforced concrete roadbed on the Pere Marquette near Detroit, Mich., but because most research in track has had to do with conventional designs, and because the studies made have not given rise to any drastic change in design, the public has heard nothing about it.

Research on Track Stresses

It is a fact, however, that since 1913 an organization known as the Special Committee on Stresses in Track has been at work on an investigation financed by the American Railway Association. Considering the simplicity of its elements, it would seem that the principles of engineering involved in track design would be correspondingly elemental. On the contrary one of the first results of this study was to disclose the intricate nature of the problem presented and to show that the development of the facts necessary for an accurate knowledge of the behavior of track in service would have to do mainly with field tests and only to a minor extent with laboratory work.

Accordingly, this investigation, conducted under the direction of Dr. A. N. Talbot of the University of Illinois, has required the taking of a vast amount of data on the stresses in rails and the deformation of the rails and other parts of the track under the wheels of trains. This information has been collected on many pieces of track in various parts of the country under hundreds of regular trains and thousands of test runs of locomotives and cars, especially assigned to these test operations. The analysis of the data thus gathered has

* This is the second of three articles on railway research and cooperative action, the first of which appeared in the issue of February 18, page 251.



The Rail Contact and Brushes of a Rail-Flaw Detector Car

required months of computation work, and the various progress reports issued to review the progress made cover a thousand printed pages.

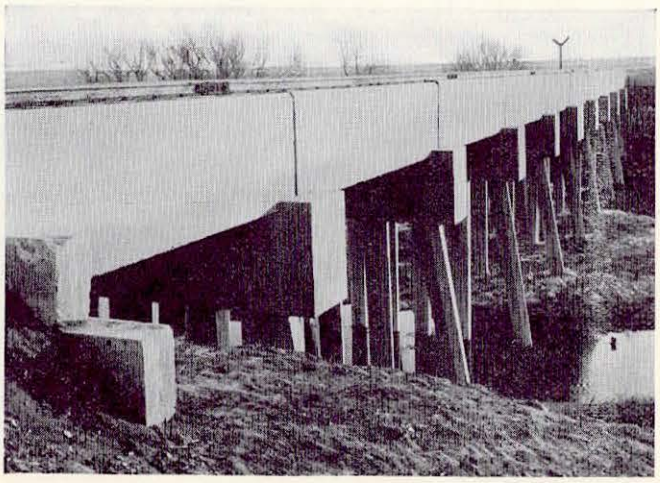
Better Designing Practice

The results of this investigation may be characterized by a gradual unfolding of fundamental facts. There is no promise of any epoch-making discovery. Nevertheless, the railways have continued to support this work at a cost of $150,000 to date, not including the much larger outlay for the train service furnished by the roads for the many field tests. They are doing this because the facts being developed will soon make it possible to effect a revolution in track design practice. Until now the depth of ballast, the size and spacing of ties and strength and stiffness of rails have been determined on judgment and experience alone. However, the way is now opening for the application to track design of the principles of engineering along much the same lines as are followed in the design of bridges and other engineering structures.

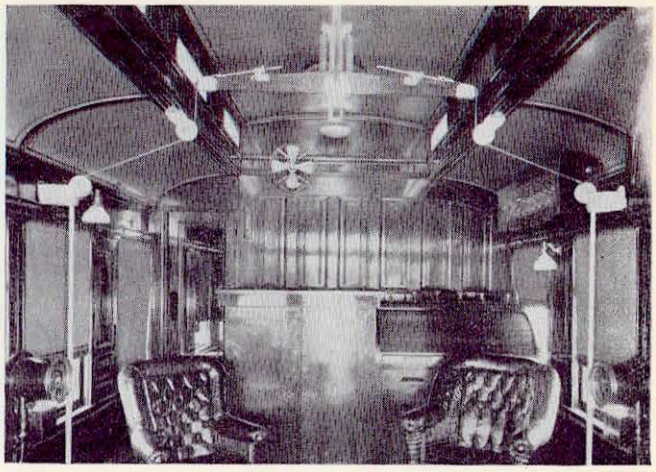
In the meantime many of the facts disclosed have been put to practical use. It has been learned, for example, that variations in the distance between wheels has a much greater influence on the stresses in the rails than the spacing of the crossties. Because of this, locomotive builders are now avoiding wide spacing between wheels. They are also giving greater attention to the distribution and proportioning of counterbalancing because it has been found that improper practice in this regard has resulted in excessive stresses in rails. The investigation has also given a scientific answer to questions long under dispute, such as that relating to the relative merits of laying rails flat on the ties or of canting them slightly inward. Because of facts disclosed, tie plates are now usually beveled so as to tilt the rails inward by an amount shown to be desirable.

Investigate Rails

Supplementing this study of track as a whole is the large-scale investigation of rails which is being directed by Professor H. F. Moore, also of the University of Illinois, and which has for its purpose the determination of the cause of internal fissures. It is being financed jointly by the American Railway Association and the rail manufacturers under a plan that will provide $50,000 annually for five years. This project comprises a more vigorous attack on a problem that has confronted the railways for nearly two decades, during which research on rails was being conducted under a variety of auspices. For a large part of this time the statistical bureau on rail failures, conducted by the Committee on Rail of the American Railway Engineering Association has been compiling data on broken rails removed from thousands of miles of track, and the facts thus made available are of definite value in the investigation now in progress. Further evidence of progress in research on rails is to be had from the annual proceedings of the A. R. E. A., which are replete with reports on investigations of the many variables that enter into the manufacture and use of rails.



The Development of the Reinforced Concrete Trestle by the Railroads Comprised a Bold Advance in the Use of this Material



Interior of Track Record Car Used by the Atchison, Topeka & Santa Fe, to Measure the Quality of Track Maintenance

Neither the results of the work on stresses in track nor the consequences of the rail investigations can be evaluated in money. The outcome of the latter is at present entirely a matter of conjecture, but the railways are willing to gamble their share of the cost on a hope of some tangible gain in the safety of railway operation. Their favorable attitude toward this project is no doubt due in part to the fact that they are now enjoying an excellent return on a previous venture in a piece of related research—the development of the transverse fissure detector. Until the creation of this device by the late Elmer A. Sperry, with the financial aid of the A. R. A., there was no way of ascertaining the presence of these hidden defects, and hundreds of tons of rails from "suspicious" heats were removed from track yearly, at great expense. The patrolling of tracks with "detector cars" now makes it necessary to remove rails from track only as their defective character is clearly established.

The A. R. E. A.

It is no mere coincidence that the three major projects of research reviewed above were initiated by the American Railway Engineering Association, since its 28 committees are constantly engaged in fostering formal research programs, in analyzing performance data, and in rationalizing the accumulated experience and service records of hundreds of railroads. Because of their services in consolidating the results of investigations carried on by individual railroads, opportunity has been afforded for the scientific study of data that are sufficiently all-embracing to warrant reliable conclusions. Much of the progress that has been made in the advancement in practices having to do with the construction, operation and maintenance of the railways must be ascribed to the work of this association.

So many projects of research relating to track have been conducted either directly or indirectly under the auspices of this association that space permits mention of

Test Party on Stresses in Track Investigation Measuring Rail and Tie Depressions Under a Heavily Loaded Car

only a few. One of these, which has had a most direct effect on track design is the investigation into the cause of the mechanical destruction of ties under the rail seats. This work, conducted by Dr. Hermann von Schrenk, a consulting timber engineer retained by several railways, disclosed that the damage is largely the result of wear rather than crushing, and as a consequence there is now a general trend toward the use of tie plates that are anchored against movement relative to the ties by spikes or lag screws independent of the spikes that hold the rails. Valuable information concerning the creeping of rails was obtained on the Nashville, Chattanooga & St. Louis as the result of measurements taken over long stretches of track for an extended period, of the gaps between the ends of rails. This served as an effective answer to one objection that had been raised to the use of longer rails and exerted a measure of influence in the adoption of the 39-ft. rail in place of the 33-ft. length.

Bridge Design

No organization of men in railway service enjoys a more enviable record in the pursuit of scientific knowledge than the Committee on Iron and Steel Structures of the American Railway Engineering Association whose Specification for Steel Railway Bridges holds a ranking position among reference works throughout the civilized world. The building up of this specification is a continuing process during which the results of a multitude of research projects, not a few of which were initiated by this committee, have been carefully interpreted in their relation to specification requirements.

Outstanding among the investigations initiated by the committee was the study of the effect of the impact of train loads on steel railway bridges. This work, financed by individual railways and conducted under the direction of Dean F. E. Turneaure of the University of Wisconsin, was a pioneer project that produced specific facts on a phase of bridge design concerning which engineers possessed but little information. The influence of this work has been recognized in as remote a part of the world as India, and has served as the impetus for further investigations in other countries. The methods developed in these tests are also being applied by railways in their own individual investigations.

Mention should also be made of the studies made by this committee of stresses in rollers for bridge bearings, of the strength of riveted joints, of the relative value of rivets driven in punched holes and in holes that are sub-punched and reamed, and of the behavior of beams employed in groups. At present, the committee is engaged in an involved mathematical interpretation of the results of tests on steel columns to the end that these tests may be of practical value in the improved design of compression members of trusses and other steel structures.

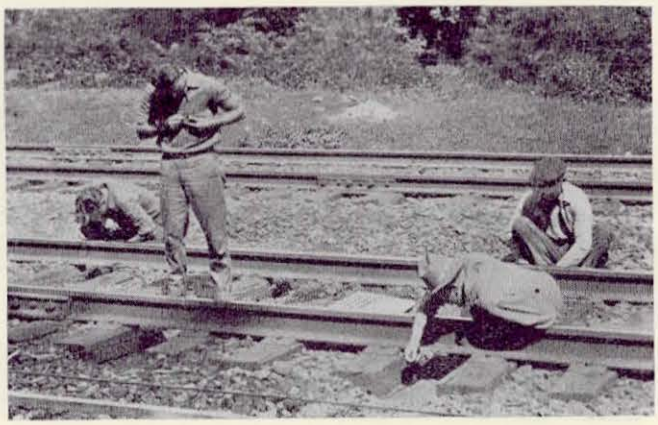
Economics of Railway Construction

It is doubtful if the economic justification of the capital improvements made by any industry is founded upon more rigid mathematical analyses than those employed in determining the economy of expenditures to reduce grades, eliminate curvature, shorten distance and decrease summit elevation on railway lines. The fundamental principles involved were developed many years ago, but because of constant progress in the design of locomotives and cars it has been necessary to institute a continuing study of such essential factors as the tractive power of locomotives, train resistance, the effect of traffic on track maintenance, fuel consumption and the like. This has called for a vast volume of field and laboratory investigation, and the study of the data obtained is centered largely in the Committee on Economics of Railway Location of the A. R. E. A., which has been engaged for 30 years in a scientific study of the problems in this field.

Collaborate in Research by Others

As stated in the introduction, much of the research from which the railways have profited has, of necessity, been conducted by the manufacturers of the materials and appliances they buy. But this does not mean that the railways have had no part in the research work conducted by others, for as a matter of fact, much of the development work that has been fruitful of the most profitable gains would not have been possible but for the co-operation and financial support that has been freely given by the railways.

Take the case of timber preservation. The high degree of development in the technic of treating wood to prevent decay has been realized only because of the pioneer work done by the railways. Not only have they spent thousands of dollars in experimental work and in the installation and observation of test tie sections, but many roads made extensive applications of treated ties at a time when no reliable data were available upon which to predicate the added life which, necessarily, determined the economies to be realized by the added investment. Similarly, the creosoted wooden bridge, now used extensively in highway construction, is strictly a railway development, likewise undertaken at a time when the ultimate return for the increased expenditure was problematical. However, the railways have profited

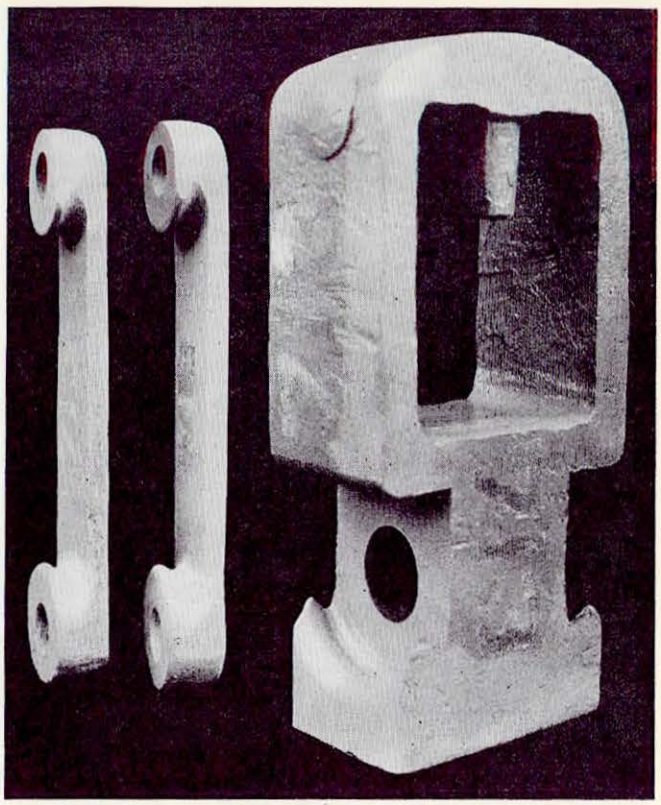


Installing Stremmatographs to Measure Rail Stresses Under Moving Trains

greatly from their generous support of this product of research; millions of dollars are being saved annually through reduced demands for ties, timbers, poles and piles.

It is true that the railroads did not venture on this undertaking unaided. The treating processes were not of their own making, and commercial treating plants had a part in the development work as has the Forest Products Laboratory of the United States Department of Agriculture. However, it is only because the railroads made extensive applications both in the form of service tests and as regular out-of-face installations that data on service life in practical installations became available.

Incidental to progress in the treatment of wood and its application after treatment, is the part that the railroads have played in meeting the problem of the wood-destroying mollusca and crustacea that abound in marine waters. The railroads were among the first to use creosoted piles in docks to resist their destruction by these wood borers, and when the wholesale destruction of wharf property in San Francisco bay about a decade ago, gave rise to an intensive investigation of the entire subject of marine borers, much of the cost was borne by contributions from 22 railways.



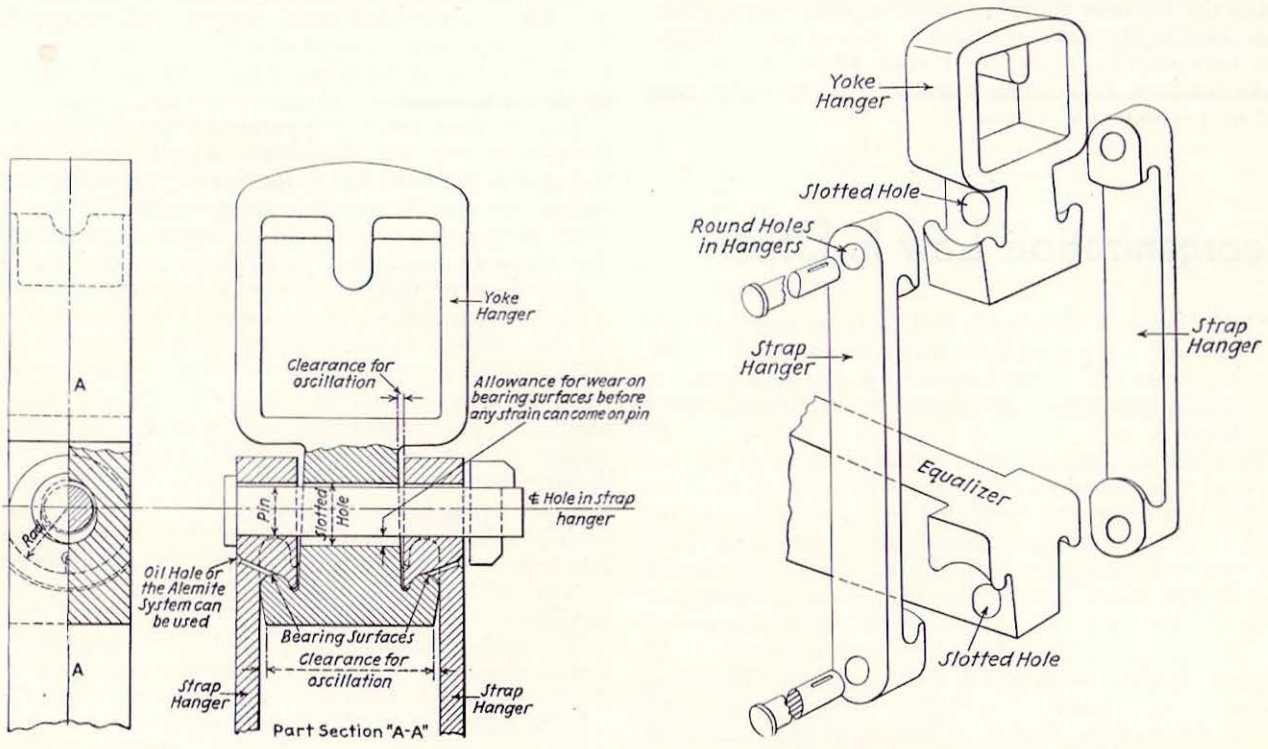
Two Views of Hanger Parts Showing the Locking Lips

Interlocking Spring Rigging Developed on the T. & P.

DURING the past five years, the mechanical department of the Texas & Pacific has been working on the development of an interlocking-type driving-spring rigging for locomotives which has proved successful in actual service on approximately 100 locomotives on that road. This spring rigging has been applied to 70 2-10-4 type locomotives, 10 heavy Mountain type locomotives and a number of Santa Fe and switching type locomotives.

The interlocking spring rigging, developed under the direction of A. P. Prendergast, mechanical superintendent of the Texas & Pacific and completely covered by patents, differs in principle from the conventional type of spring rigging in that the hangers are so designed that the load is not taken by the spring-rigging pins.

The principal feature of this spring rigging is a flexible interlocking joint shown in one of the illustrations. It will be seen that the joint connection consists of a boss and an interlocking lip that holds the parts out of contact with the hanger pin. These joints have been provided at



Sectional View and Details of the Interlocking Spring Rigging Joint

the ends of the hangers and the parts which they engage and the design of these joints is such that the hanger pins are not subjected to the usual load. Actually, the use of hanger pins is not necessary since the interlocking feature prevents the separation of the parts when in tension. However, the pin is used in some cases as an additional protection, should some condition arise which could tend to roll or disengage a part from its mate. Such conditions are not liable to occur and, in fact, have never occurred during an extensive experience.

An examination of the detailed drawings will reveal that where the pins are inserted, a slotted hole is provided in one of the members at each joint to allow for a certain amount of wear on the bearing surfaces before any strain can get on the pin. If the wear on the bearing surfaces should progress to such an extent as to cause the pin to be under a strain, the connection as a whole becomes stronger as the bearing value of the pin would then be added to the value of the bearing surfaces on the bosses. Likewise as the wear progresses on the joint, the strength of each connection is not diminished throughout its remaining life. This feature alone is said to prevent many spring-rigging failures on the road.

Due to the fact that the operating surfaces of the entire rigging are in constant contact with one another, wear is reduced and the rigging adjusts itself more rapidly to a position parallel with the locomotive frames. This keeps the hangers from coming in contact with the frames, preventing wear on the frames. In addition, it is said that because of this condition, constant equalization of the weight of the locomotive is insured, resulting in easier riding.

Some of the locomotives in service on the Texas & Pacific have operated over 400,000 miles with no maintenance as far as the spring rigging is concerned either at the engine terminal or at the periodical shopping during this mileage. In addition to the design shown in the illustration, other variations of this type of spring rigging have been developed in which the same principles apply.

There are many other locations on a locomotive or car where the features embodied in this spring rigging have been used to the same advantage, such as on the drawbars between the engine and tender, brake connections, brake hangers, brake-hanger connections to brake head and on couplers and yokes.

Reorganization Law In Effect

WASHINGTON, D. C.

THE Hastings bankruptcy bill, with its provision for railroad reorganizations under the control of the Interstate Commerce Commission as a substitute for receivership procedure, was signed by President Hoover on March 3.

This bill was passed under great pressure in the last week of the Congressional session in spite of the fact that it had not been considered by a committee in the Senate and the Senate amendments had never been referred to a committee in the House, and, as the Senate amendments were accepted by the House without conference, there was no opportunity to perfect some of the details of the bill which had been expected if the bill had gone to conference in the usual way. The alternative was presented of accepting the bill as amended on the floor of the Senate or having no bill at all until it could be reconsidered in the special session. No hearings had been held on the railroad section of the bill before either House or Senate committees and the Senate judiciary committee had reported the bill without the sections dealing with railroads and other corporations, recommending that they be postponed until the special session. The bill had, however, been the subject of an unusual amount of work by sub-committees of the judiciary committees of both the House and the Senate in consultation with representatives of both the outgoing and incoming administrations, the railroads, and financial institutions.

The speed with which this bill was handled after it reached the floor of the House and the Senate was considered rather remarkable by those who have followed the progress of the protracted hearings held during the past few years on various bills to amend the interstate commerce act which have not yet been acted upon.

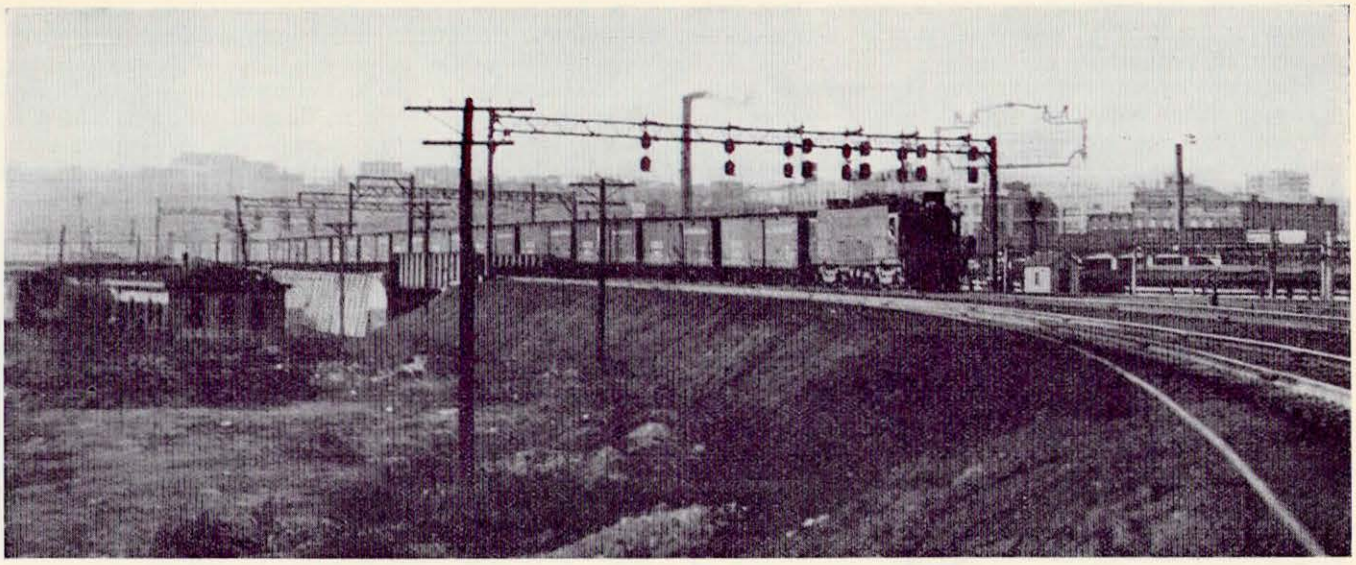
Aside from its emergency aspect, however, the bankruptcy bill contained several features calculated to give it a large vote. It had been strongly urged both by President Hoover and President-Elect Roosevelt, it was coupled with provisions designed to afford relief to farmers and other individual debtors, and it was supported by members of Congress who are usually considered anti-railroad as well as by those who have been willing to be known as more or less friendly to the railroads. Some of the former were particularly keen to vote for a bill that promised to reduce railroad capitalization while patting themselves on the back for their willingness to extend some "relief" to the railroads, and the latter knew that many railroads had reached such a serious situation that the legislation was necessary to avert several receiverships even if it did contain several features which they would have preferred to change if more time had been available.

Aside from the power vested in the Interstate Commerce Commission to approve or disapprove a reorganization plan the commission will be given an opportunity to influence the management of any railroad that goes through the reorganization process through its function of selecting the names of those who may be appointed trustees in charge of the operation of the properties. The law provides that such trustees shall be appointed by the judges from a panel of standing trustees qualified for such service to be selected and designated in advance by the commission.

The railroad labor organizations are congratulating themselves over the amendment which Senator Norris had inserted into the bill in the Senate, providing that no judge, trustee, or receiver acting under the law shall deny or in any way question the right of employees on the property under his jurisdiction to join the labor organization of their choice or to interfere in any way with the organizations of employees, "or to use the funds of the railroad in maintaining company unions or to influence or coerce employees in an effort to induce them to join or remain members of such company unions." The amendment also provides that no such judge, trustee, or receiver shall require any person seeking employment to sign any so-called "yellow-dog" contract or agreement promising to join or to refuse to join a labor organization, and that, if such contract has been enforced on the property, the employees shall be notified that it has been discarded and is no longer binding.

The authorization to the President to reorganize government agencies was approved by the Senate on March 3 when it accepted the conference report on the Treasury-Postoffice appropriation bill, to which the reorgani-

(Continued on page 373)



In Transfer Service the Locomotive Receives Power From the Overhead Contact System

Operation of Three-Power Locomotives

D. L. & W. finds motive power suitable for both switching and transfer service — Offers equivalent of complete terminal electrification

By F. H. Craton

Transportation Engineering Department, General Electric Company, Erie, Pa.

WITH the decision to electrify its suburban service in northern New Jersey, the Lackawanna saw the desirability of completely electrifying the Hoboken and Jersey City terminal area. Complete electrification of this district would mean the removal of all steam locomotives, allowing realization of the maximum advantages and economies to be derived from electrification. However, operating conditions were such that complete 3000-volt electrification of all trackage, including yards, would have been a burden to the project rather than a means to substantial economies. To provide economical electric operation of all service, therefore, presented a real problem, the solution of which is interesting because equally applicable to other electrification projects.

The general layout of the Lackawanna tracks which are directly related to the operation of the Hoboken and Jersey City terminal is shown in one of the illustrations. The Hoboken terminal is used exclusively for passenger service, being the starting point for all suburban and through trains.

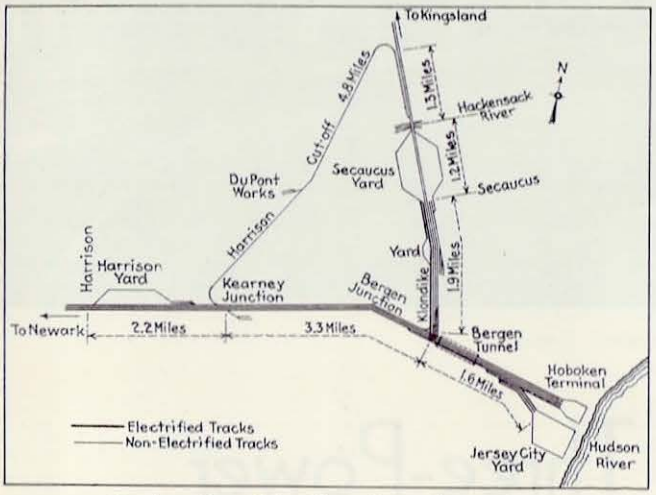
The Jersey City yards constitute the tidewater freight terminal of the road, with coal and grain docks, float and lighterage service, warehouses, and other related facilities. As this yard is stub-ended at the river front and is limited in size, a large hump yard is used at Secaucus for classification work. A few fast freights are the only trains operated in and out of Jersey City without breaking up at Secaucus, the remaining freight traffic being handled by a transfer service between the two points. The locomotives in this transfer work, which also includes some operation between Secaucus and Harrison, not only move the trains between yards but also do part of the make-up and break-up work at each end of the run.

Electrification with external power facilities is economical where the amount of traffic to be handled is great, but the wiring of freight yards and little used tracks is often an unprofitable burden to an electrification project because the amount of work done on these tracks does not usually justify the expense involved. Such was the case on the Lackwanna. The problem was to get a locomotive with sufficient flexibility to do heavy switching in the yards on its own power and also be able to move the transfer trains at relatively high speed between yards on main line track, where external power would be available.

The Lackawanna decided to try two trolley-oil electric-battery locomotives in this transfer work as a part of the suburban electrification program, for the purpose of determining if a locomotive of this type would not make it possible eventually to remove all steam locomotives from the freight, switching, and transfer service in this area. Accordingly, two locomotives were put in service in October, 1930, operating between Jersey City, Secaucus, and Harrison yards, handling the transfer or "tunnel run" trains. The demands of this service were unusual both as to the flexibility required of the motive power and the power necessary to handle the trains as desired. Making allowance for locomotive weight and

horsepower, the service being performed by these locomotives is probably as severe as on any other electrification in this country.

The two locomotives are the "three-power" type, operating from 3000-volt trolley, from a storage battery, or from storage battery and oil engine-generator set connected in parallel.* Table I gives the pertinent data on these two locomotives, which are the first of their kind to be built for 3000-volt external-power operation.



Territory Served by Three-Power Locomotives

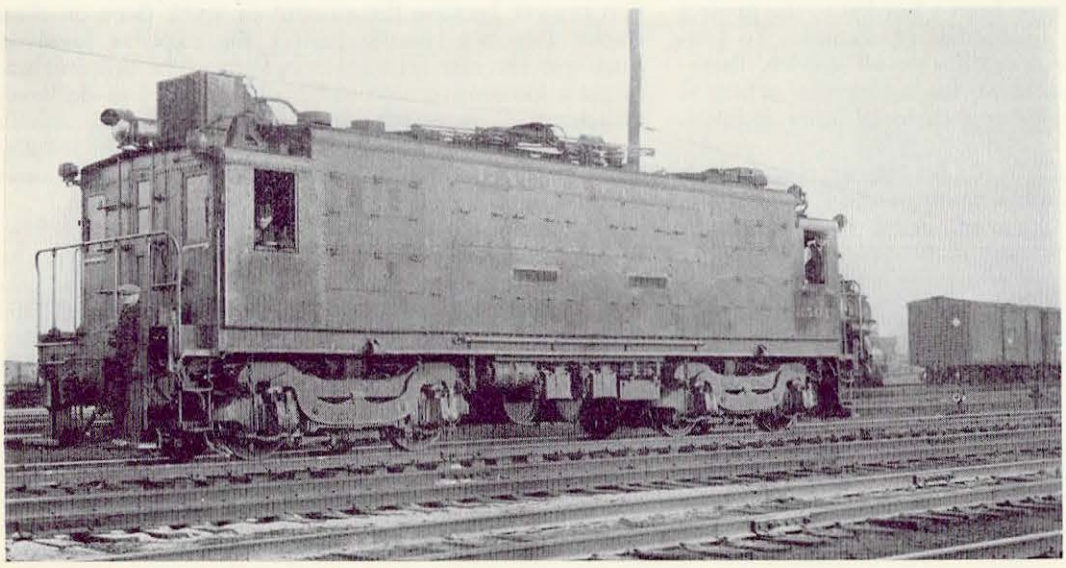
Between Secaucus and Jersey City, eastbound, the trailing tonnage rating of the locomotive is 2500, although as much as 3200 tons have been hauled on this run. The profile from Jersey City to Secaucus Yard (see illustration) clearly indicates that this service is done purely on short time overload capacity. Owing to the character of the yard tracks at Secaucus and the fact that the cars are comparatively cold when started, it is usually difficult to get these trains under way, with the result that the greater part of the acceleration takes place on the .55 per cent grade just east of the yard. To accelerate over 2600 tons (including locomotive) up this grade requires a tractive force just under the slipping point of the wheels and equal to twice the hourly rating of the equipment. Moreover, this tractive force must be maintained from the start at Secaucus practically to the top of the grade at Bergen Junction; under bad rail conditions, severely hampering acceleration, the run to Bergen Junction sometimes takes 15 to 20 minutes. It is not unusual when accelerating a heavy train up this grade, to reach a peak wheel horsepower of 3600, compared with an hourly rating of 1600. Because of main line traffic at Bergen Junction, a stop is usually necessary at this point. The subsequent start is unusually severe since practically the entire train is on the .55 per cent grade and the locomotive on a nine-degree curve. The remainder of the run into Jersey City is down grade, which allows the equipment to cool.

Further examination of the profile indicates that the run from Jersey City to Secaucus is no less severe than that in the other direction. The trailing tonnage is limited to 1800 in this direction and consists largely of empties. Frequently 75-car trains are hauled on this run, and on one occasion a 108-car train out of Jersey City was hauled successfully with one locomotive. Again, conditions are severe. When starting, a large portion of the train may be on the .7-.8 per cent grade in the yard, and nearly the entire train on no less than .4 per cent grade. The acceleration must be accomplished up this grade, and with the train on from six to ten cross-overs, a number of which the locomotive passes through during

Table I

Wheel arrangement	B-B
Length inside knuckles	48 ft. 0 in.
Height over pantograph locked down	15 ft. 2 3/16 in.
Total weight in running order (all on drivers)	248,000 lb.
Rated voltage on external power	3,000
Continuous horsepower rating on external power	1,450
Hourly horsepower rating on external power	1,600
Continuous tractive force rating	22,200 lb.
Hourly tractive force rating	25,200 lb.
Speed at continuous rating on external power	24.5 m.p.h.
Speed at hourly rating on external power	23.8 m.p.h.
Maximum tractive force (30 per cent adhesion)	74,400 lb.
Traction motors:	
Number	4
Type	Axle hung
Voltage	1500/3000
Gearing	72/17
Ventilation	Forced
Drive	Single cushion gear
Oil Engine:	
Type	Ingersoll-Rand solid injection
Horsepower	300
Speed	550 r.p.m.
Generator	200 kw.
Battery:	
Type	Exide Ironclad MVA-21
Number of cells	360
Ampere hour capacity at 6-hr. rate	340
Kilowatt hour capacity at 6-hr. rate	242
Average discharge voltage at 6-hr rate	712
Connection of cells	Series
Grounded at	Negative
Control:	
Type	Electro-pneumatic, non-automatic
Motor combinations on external power	2
Motor combinations on internal power	3

* For description of this type of locomotive, see *Railway Age*, October 18, 1930, page 794.

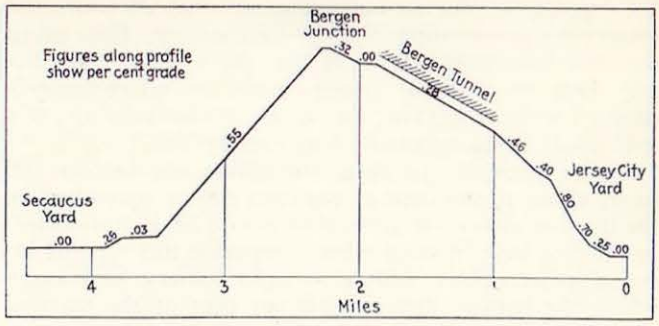


Switching Operations are Performed on Internal Power

the stiffest part of the acceleration. These accelerations require that about 400 amperes per motor (nearly twice the hourly rating) be held, corresponding to 22 per cent adhesion, and this tractive force is maintained if possible until the locomotive is well into the tunnel. However, under some conditions the rail in the tunnel is exceptionally slippery, resulting in frequent wheel-slipping and loss of time, which makes the requirements even more severe. Shortly after passing Bergen Junction the pantograph is lowered and the train taken into Secaucus Yard on internal power.

It is believed that these two runs, with rated tonnage and average conditions, represent as severe operating demands on a locomotive of this weight and horsepower as any comparable electric locomotive application. This type of operation permits handling heavy trains with a locomotive of comparatively low continuous tractive force capacity, by utilizing fully the high short-time rating and the high starting tractive force available.

It is seen from the map that practically all work in the yards must be done on internal power; that is, oil-engine-battery power. When operating from this source, the maximum available tractive force is limited only by the slipping point of the wheels, as on trolley. However, owing to the limited horsepower of the internal power plant, the speed of the locomotive is reduced.



Profile of Line Between Secaucus Yard and Jersey City Yard

power is used for some distance. With operation of this kind, the average power required was found to be about 50 kilowatts, although peak points of 800 kw. were sometimes attained.

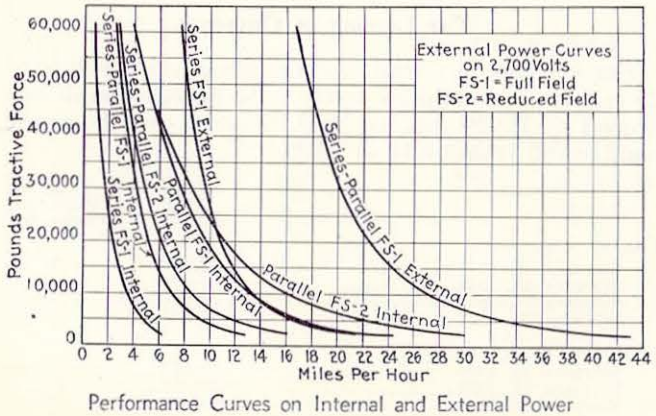
These locomotives were used also for regular switching service for a limited period, and the average power required was found to be again about 50 kw. The average power necessary properly to handle these same trains in the transfer work on external power was 450 kw. Therefore, a ratio of about 9 to 1 exists for the average power used on main and yard tracks for this general class of work. It is believed that this is the first time this ratio has been established by actual test. It is interesting to note also that the power required in the yard work checked very closely with data secured in similar work on another railroad, establishing 50 to 60 kw. as a general figure to use for heavy switching operation. The wide divergence in average power requirements for switching and for transfer work is explained by the fact that, when switching, comparatively light loads are handled intermittently at low speed, while the transfer runs demand that heavy loads be hauled continuously at comparatively high speed.

Table II

Time	Place	Work	Cars	Tons	Power	Remarks
8:00— 9:25 PM	Jersey City Yard	Switching	—	—	Engine—Battery	Making up train
9:25— 9:40	Jersey City to "Klondike"	Transfer	61	1530	Trolley	
9:40— 9:55	"Klondike" to Hackensack River	Transfer	61	1530	Engine—Battery	No overhead wire
9:55—10:40	Secaucus Yard	Switching	--	—	Engine—Battery	Making up train
10:40—11:05	Secaucus to Kearney Junction	Transfer	42	2420	Trolley	
11:05—11:30	Kearney Junction	Switching	—	—	Engine—Battery	Puts 10 cars on Penna. tracks
11:30—11:45	Kearney Jct. to Harrison	Transfer	32	1900	Engine—Battery	
11:45—12:30 AM	Harrison Yard	Switching	—	—	Engine—Battery	Breaking up and making up train
12:30—12:55	Harrison to Du Pont Works	Transfer	50	1270	Engine—Battery	
12:55— 1:30	Du Pont to Celluloid Works	Switching	—	—	Battery	Oil engine shut down to avoid fire hazard
1:30— 2:30	Du Pont Works to Secaucus	Transfer	50	1250	Engine—Battery	
2:30— 3:53	Secaucus Yard	Switching	—	—	Engine—Battery	
3:53— 4:45	Secaucus to Jersey City	Transfer	48	2330	Trolley	
4:45— 5:15	Jersey City Yard	Switching	—	—	Engine—Battery	Breaking up train

The performance curves show, however, that on internal power operation the traction motors may be connected in full parallel and their fields shunted, resulting in good utilization of the equipment for sustained high-speed operation with light loads, or moderate speed for limited periods with heavy loads.

Operation in the yards consists of partially making-up or breaking-up outgoing or incoming trains, to the extent of consolidating two or three sections of the train, or splitting up, as the case may be. After being made up, the full train is hauled on internal power as far as the trolley wire. Approaching the yards also internal



Performance Curves on Internal and External Power

When these locomotives are run to Harrison it is frequently necessary to make the return trip to Secaucus over the Harrison cut-off, (See map) which is not electrified, requiring a run of about nine miles on internal power. During an observation period covering 10 runs over the cut-off, the average train was 38 cars and 1100 tons trailing. The maximum train during this period was 49 cars and 1573 trailing tons. The oil-engine-battery type of power plant is not designed for continuous operation of this kind since the average power requirement greatly exceeds the oil-engine capacity, and the battery eventually would be drained. However, the service requirements call only for one trip over the cut-off per eight-hour shift, which is well within the capacity of the internal power plant.

For an economical battery life on a locomotive of this type, the discharge should be limited to 125 per cent of

the capacity at the six-hour rate for each 24 hours the locomotive is operating in three-shift service. Data taken on these locomotives indicate that the average work being done on internal power could be approximately doubled without working the battery excessively, and this will result in exceptionally long battery life.

Under present operating conditions the battery delivers about 10 per cent of the total energy consumed by the traction motors on internal power. This is an interesting fact to have in mind when comparing this type of internal power plant with a straight battery locomotive where the battery delivers 100 per cent of the traction motor power. The battery locomotive must be out of service periodically for charging while the engine-battery combination can operate continuously 24 hours per day.

The most noteworthy feature of the "three-power" locomotive is its great flexibility, and this is no better illustrated than by a typical shift on the Lackawanna, outlined in Table II.

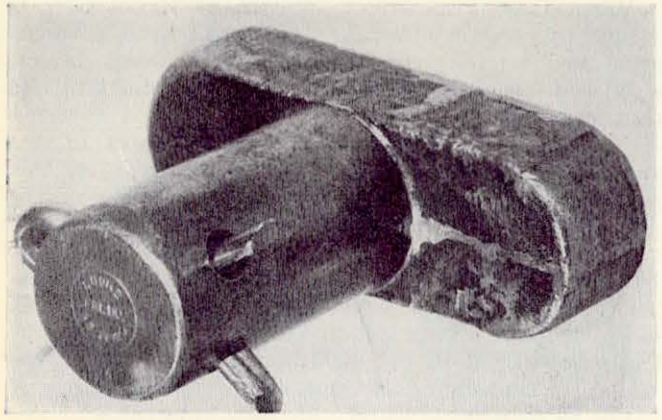
These locomotives have been in service about two years and their operation has been very successful. Because of their versatility, it has been demonstrated by test that they can be used for continuous work in high speed transfer service on 3000-volt power for 24 hours per day in heavy yard switching, or in any desired combination of these two. They appear to be well adapted to the requirements of the Lackawanna, and offer a means for eventual elimination of all steam from the terminal freight and switching service.

Draft-Key Retainers With Self-Locking Cotter

TO eliminate the trouble experienced by many railroads of having cotter keys lose out of the A. R. A. draft-key retainers, the American Railway Products Company, Inc., 74 Washington street, South Norwalk, Conn., has adapted the Cooke self-locking cotter to this special application. This has been developed as an improvement over the application of a soft rivet in lieu of a cotter, as described in the June 18, 1932, issue of the *Railway Age*.

The Cooke cotter is an ordinary cotter with the prongs forming an internal *V* for easy spreading and the end of the retainer bored with a Y-shaped hole. The cotter is inserted in the proper hole and tapped lightly with a hammer. The first tap spreads the prongs of the cotter on the wedge formed by the intersection of the two lower holes. Further taps drive the cotter home, spreading the prongs at a wide angle and binding them tightly against the sides of the Y-shaped hole, locking the cotter firmly and thus eliminating vibration and the resulting wear.

No additional bending of the cotter prongs is necessary. The Y-shaped hole is provided with shoulders above the wedge which prevent the cotter from entering any except the right hole, thereby making it fool proof. These shoulders also wedge the prongs by tending to create an S-curve.



Draft-Key Retainer with Cotter in Place

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended February 25, which included the Washington's Birthday holiday, amounted to 459,079 cars, a decrease of 55,311 cars as compared with the week before and of 76,419 cars as compared with the corresponding week of last year. Grain and grain products and forest products showed small increases as compared with the week before but there was a large reduction in coal loading and some reductions in miscellaneous freight and l.c.l. merchandise. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week ended Saturday, February 25, 1933

Districts	1933	1932	1931
Eastern	104,652	125,933	156,567
Allegheny	86,161	107,960	142,875
Pocahontas	36,118	35,810	39,979
Southern	73,498	82,097	107,447
Northwestern	51,932	61,308	81,349
Central Western	65,416	78,189	96,961
Southwestern	41,302	44,201	56,043
Total We[illegible] Districts	15[illegible]	183,698	234,353
Total All Roads	459,079	535,498	681,221
Commodities			
Grain and Grain Products	28,319	32,627	41,050
Live Stock	14,422	18,375	20,034
Coal	101,641	108,203	125,509
Coke	4,850	5,959	7,782
Forest Products	14,140	19,640	33,213
Ore	1,689	2,833	5,730
Mdse. L. C. L.	143,390	169,733	198,569
Miscellaneous	150,628	178,128	249,334
February 25	459,079	535,498	681,221
February 18	514,390	572,265	713,156
February 11	501,320	561,535	720,689
February 4	483,192	573,923	719,053
January 28	472,088	560,343	719,397
Cumulative total, 8 weeks	3,868,477	4,509,992	5,707,330

Car Loading in Canada

Car loadings in Canada for the week ended February 25 failed to maintain the level of the previous week and droppd to 33,939 cars, or by 1,940 cars, and the index number fell from 61.31 to 59.25.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
February 25, 1933	33,939	17,668
February 18, 1933	35,879	18,899
February 11, 1933	30,691	16,211
February 27, 1932	43,591	21,278
Cumulative Totals for Canada:		
February 25, 1933	256,215	137,420
February 27, 1932	328,437	166,719
February 21, 1931	364,677	216,956

The Economic Selection, Treatment and Use of Cross Ties*

Importance on cost and service life of systematic purchasing and handling of each species emphasized

By D. C. Curtis
Chief Purchasing Officer, Chicago, Milwaukee, St. Paul & Pacific, Chicago

THE economic selection, treatment and use of ties require: (1) A complete survey of the nearest timber available at a reasonable price for ties; (2) placing orders on the producer by grades and species and requiring that, in loading cars, the grades and species be segregated; (3) charting the railroad to show the most desirable wood and treatment to use on each section of track; (4) separation of ties at treating plants into grades and species to insure specific treatment for each species; (5) selection of the treatment for each kind of wood and the place where they are to be used; (6) planned ordering to insure the purchase of the correct tie for each place.

Kind of Ties Used

A survey of the available timber on or adjacent to the Milwaukee has resulted in grouping the ties as follows:

For Lines East of Mobridge, S. D.

Group 1—Red and white oak. Grades 1 and 2 are treated with zinc; Grades 3, 4 and 5, with oil and creosote.
Group 2—Gum ties. Grades 1 and 2 receive zinc treatment and Grades 3, 4 and 5, oil and creosote.
Group 3—Black walnut, cherry, hard maple and yellow birch. They receive the same treatment as shown for Group 2 ties.
Group 4—Northern pine, live tamarack, rock elm and red maple. Zinc treatment.
Group 5—Southern pine. Zinc treatment.
Group 6—Cedar. No treatment.

For Lines West of Mobridge, S. D.

Group 1—Coast Douglas fir. Oil treated.
Group 2—Inland Empire larch. Untreated.
Group 3—Inland Empire fir. Untreated.
Group 4—Coast Douglas fir. Untreated.

The cross ties purchased for the Milwaukee, Lines East of Mobridge, in 1931, were divided as follows:

	Per Cent
Red oak, white oak, black walnut, cherry	32.53
Hard maple, yellow birch, beech	35.70
Hemlock, northern pine, tamarack, rock elm, red maple, butternut	14.45
Cedar	3.27
Southern pine	5.58
Gum	8.47
	100.00

The ties purchased for use on the Eastern lines of the Milwaukee are familiar species and require no explanation, but this is not so with the ties of the Pacific Northwest and the territory West of the Cascade mountains, which produce two species of wood for cross ties—Douglas fir and West Coast hemlock. The West Coast fir, treated with an 8-lb. creosote-and-fuel-oil mixture, are giving very good life, particularly on tangents. The hemlock ties are also giving good results with similar treatment. Hemlock takes treatment as well as fir, but does not take artificial seasoning as well, because of the sapwood, which ranges from 35 per cent to 78 per cent. The Inland Empire produces red fir, larch and pine, which are used for cross ties, the fir and larch being much more refractory woods than Douglas fir.

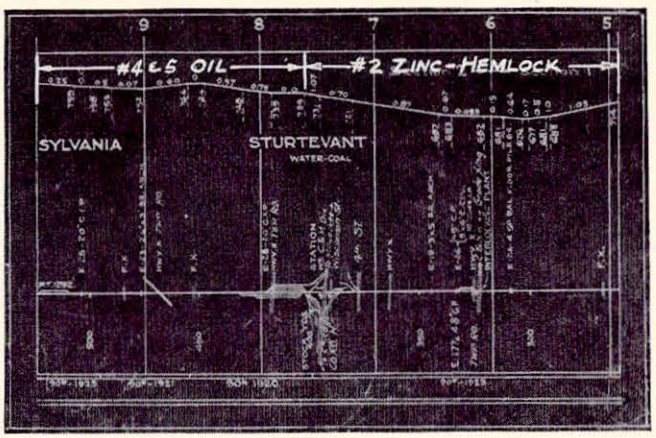
Tie Specifications

Most railroads require a maximum of one-third summer wood in six or more rings of annual growth, and 50 per cent summer wood in fewer rings, which seems to make a good specification for West Coast ties. The rings do not insure a good tie unless the summer wood is also present. A Douglas Fir tie, with 20 rings to the inch, but without one-third summer wood, for example, does not make as good a tie as one with only five rings and 50 per cent summer wood. Consequently, a specification based on annual rings only is not sufficient to insure a tie which will be the most economical in the long run. The Inland Empire fir and larch are naturally close-grained and exceedingly dense; consequently, it is not necessary to reject ties of these species because of insufficient summer wood.

Comparative uniformity in grades of these ties is secured by specifying the desired percentages of each grade instead of accepting the run of the woods. This is shown by the following record of Western ties purchased by the Milwaukee:

Year	Culls Per Cent	Rejects Per Cent	Grade 1 Per Cent	Grade 2 Per Cent	Grade 3 Per Cent	Grade 4 Per Cent	Grade 5 Per Cent
1925	7.6	14.2	15.2	13.3	47.7	.8	1.2
1926	3.0	9.9	12.8	12.4	58.7	1.1	2.1
1927	1.93	6.08	12.8	15.02	52.23	6.74	5.20
1928	2.0	6.81	14.27	14.03	49.03	10.14	3.72
1929	.43	7.36	14.50	15.49	47.98	9.80	4.44
1930	.46	6.17	15.10	14.68	43.42	13.64	6.53
1931	.05	5.83	12.62	14.63	41.84	19.74	5.29
1932	...	3.00	7.00	15.00	40.00	30.00	5.00
1933	...	...	10.00	15.00	40.00	30.00	5.00

Orders on the producer should state in specific terms



A Sample Page from the Condensed Profile Map of the Milwaukee Showing How the Road Designates What Kinds of Ties are to Be Used at Different Points on the Road

* From an address before the American Wood-Preservers' Association, Chicago, on January 25.

exactly what is wanted; the kinds of wood and the grades and quantities of each that will be accepted. Instructions should require that the ties be manufactured properly, the species and grades separated and the ties piled properly for seasoning as fast as they are produced, whether they are at the point of production, at the loading platform or in the producer's possession.

Profile Maps Control Distribution

The distribution of ties for renewal work on the Milwaukee is now governed by track profile maps which are marked to show the kind of ties to be placed in each section of track. This tie charting started from an investigation to discover the major reasons for tie renewals. We had been working on the supposition that the reasons for removal were decay, rail cutting, etc., but discovered that a tie removed because of rail cutting was often not the logical tie to use. It was found that where a zinc-treated tie was removed because of decay resulting from the preservative leaching out under water or through extreme dampness, an oil-treated tie would probably have attained full life. It was also decided that, under certain traffic conditions, larger ties could be substituted for smaller ties to advantage. The rate of renewal was reduced on some divisions by placing hardwood ties on curves and softwood on tangents, although this often requires the shipment of 12 or more kinds of ties to one division.

A study preparatory to charting a division properly by sections for the purpose of getting the right tie in the right place can only be made by motor car and requires the full co-operation of division engineers, roadmasters and, above all, the section foremen who must be shown the benefit of placing ties on the basis of the greater life expected, even though the ties are heavier, offer greater resistance to spike driving and require the removal of additional ballast. To illustrate the importance of such a program, it was found that hardwood ties were continuously ordered for a certain division which had nearly 50 miles of tangent track to one of curves, although softwood ties, properly tie-plated and treated, would reflect yearly savings on the tangent track.

Segregation at Tie Plants

Too often in the past, a tie has lost its identity as soon as it was delivered to the treating-plant yard for either treatment or seasoning. The only way to select suitable ties from 5 to 12 months prior to their actual use is to see that they are piled by species and by grades in the treating plant and that proper records are kept. They are then available for treatment, adzing, boring and marking for the place to be used.

It has been proved conclusively that in wet territory the roadbed should be completely protected with ties treated with oils. Where the Milwaukee runs parallel with rivers or through swamps, it has been found that a zinc-treated tie rarely gives a life exceeding 11 years, while oil-treated ties will give 20 years' life in the same territory. It is even economical to put oil-treated ties on Class-B or minor divisions in places where the soil is always damp.

The economical life that can be expected of a wood is an important item in the selection of the treatment. It has been found that artificially seasoning certain woods not only affords a saving in carrying charges but also reduces checking and secures better penetration and distribution of the preservative. By artificial seasoning, the cellular structure does not have the time to take a permanent set and the channels of treatment are more open than under summer-air-seasoning conditions. The different species also take treatment differently, one treatment being better than another for a particular species.

Most treating plants are now equipped with adzing and boring machines which have attachments for various markings so that, by running each species through separately, the ties can be marked for the service for which they are best fitted. Orders can then be filled with the grade and species required. It is also easy for everyone handling a tie to see that it is applied in the proper place. This prevents a branch-line tie from getting into a main-line track and a main-line tie from getting into a branch-line track, or an oil-treated tie from being inserted where a zinc-treated tie should be used and a zinc tie from being put in where an oil-treated tie should be used.

Tie Treatment Costs

Railroads, like individuals, must restrict their expenditures to their income. It is necessary to select the species and treatment that will come within the income rather than the species and treatment that would be most economical. It is necessary, therefore, to determine the comparative costs of different treatments in different species and then divide the money that is available to the best advantage. By having the grades and species separated and knowing the costs of the different treatments, it is comparatively easy to determine results and the costs per year that will be obtained from the different ties.

A vast difference has been found in the problems of treating Douglas or Coast fir and Inland Empire fir. We feel that, by incising, boring and adzing the Douglas fir and treating it with the Boulton process, the best results are being obtained at the least cost. The total lapsed time in treating the fir with this process averages 19 hr. during the winter months and 16 hr. during the summer, the difference arising from the seasoning of the ties received in open cars. A large quantity of hemlock ties, air-seasoned and treated with the Lowry process, have given more than 19 years' life.

Idaho fir and larch are refractory and we have not yet succeeded in developing a process that will secure the desired penetration and diffusion for the expense involved. The penetration, incising and treatment of the Inland fir and larch give a saw-tooth treatment effect, varying with the depth of the teeth, but with no diffusion along the ring growth. However, research work is being actively carried on and we are not discouraged.

Treating plants, as well as treating engineers, should refuse to be parties to any treatment that is not good practice. If oil, for example, is delivered to the plant which is known to be below grade, it should be rejected. If any party desires pressures or heats that are ruinous to the woods, they should be denied. It is difficult for a commercial plant to oppose its customer, but retribution is sure to follow where material is improperly treated and sent out, for the consequent short life does not pay for the expensive treatment and leads to the conclusion that treatment does not pay. This may mean the abandonment or curtailment of treatment, which will react on the commercial plant.

Ties should not be kept too long in the seasoning yards, even during depressions, as decay sets in and the benefit of treatment is correspondingly lost. Any economy that might be obtained by delaying treatment beyond the safe limit is offset proportionately by loss of life in the tie. Ventures of this sort are easily covered up, but the railroad must pay the bill sooner or later.

Ties should be ordered the same as any other material, —a specific tie for a specific service and a specific place. The requisitions should be so made and so marked and

the ties shipped as called for. The ties can be loaded in such a way that they will be distributed and applied to their proper places. The right tie in the right place requires a study that must be completed months prior to actually receiving the shipping requisition. The factors can be determined largely by fall inspection and by knowing if work will be done piece-meal, by large gangs, or small section forces, so that the orders may be drawn intelligently and shipments be made in the quantities desired.

Citizens League Enrolls 212,000 Voters

THE Citizens Transportation League, which was organized at St. Paul, Minn., on November 1 to promote a co-ordinated state and nation-wide drive to reduce taxes, makes highways safer and to maintain orderly, efficient transportation at lowest possible rates, has developed into an organization of 212,000 voters in Minnesota and 40,000 in North Dakota. At the same time, the activities of the league are being extended into Montana and Washington. Associations of similar purpose and methods are organized in approximately three-fourths of the states—their strength lying in the fact that they are not working for the selfish interests of railroad employees or any one group, but include as active members all classes of citizens, whose interests on other matters may be widely divergent, but who unite in their desire to end the inequities in the present transportation situation, which injures them all.

The significance of the movement is reflected in the activities of the Minnesota league, by the strength of the public sentiment which it has disclosed in favor of preserving adequate railroad transportation, by the united effort of employees to promote the general good of the industry in which they are engaged and by the mobilization of votes. It is significant also that almost 90 per cent of the railway employees in Minnesota are enrolled in this league and that 2,000 employees in St. Paul and an equal number in Minneapolis volunteered to take a city block or two each and to make a house-to-house canvass, seeking to enlist support for the league. The political significance of the league is demonstrated by the fact that the largest vote ever cast in St. Paul was about 100,000 and that more than half, or 55,000 of these voters, have pledged their support in writing to the league program. In Minneapolis, 75,000 pledges have been obtained which number is also about half of the active voters.

Another interesting feature of this work has been the method employed for educating public opinion. Other campaigns have employed public speeches, the radio, magazine and newspaper articles, pamphlets, and the United States mails, but this campaign has been conducted through the efforts of railway employees to bring about direct, personal interviews with every individual voter. Interviewers are equipped with printed pamphlets giving the program and arguments, which they request each voter to read and then to sign the membership card.

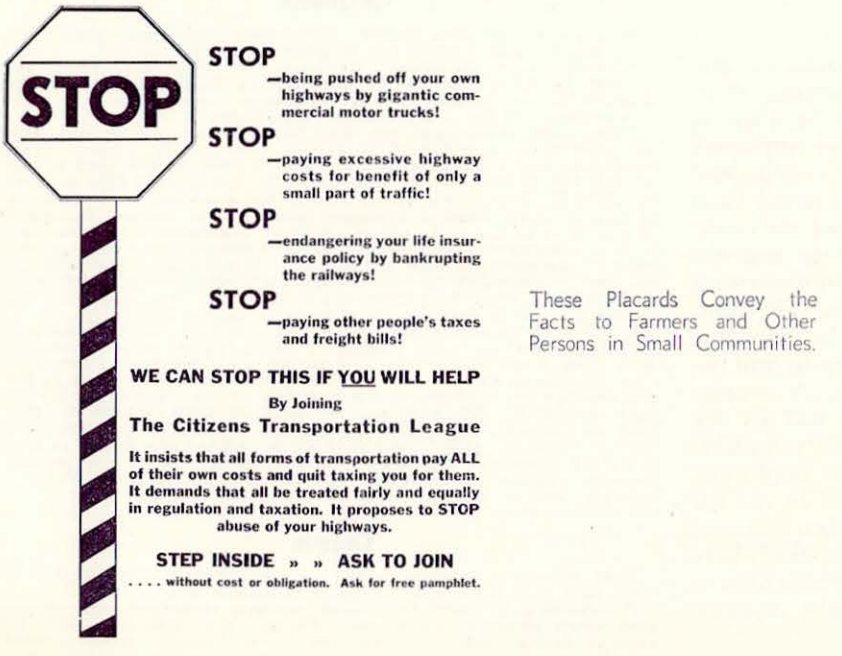
The membership of each league includes producers and shippers dependent upon railroad transportation and the lowest possible freight rates, taxpayers eager to stop subsidies to private business, consumers to whom all taxes and freight bills are passed through higher prices for everything they buy, farmers and dealers whose livelihood has been taken away or imperiled by unfair regulation and subsidized competition, insurance policyholders, savings bank depositors and investors whose future protection depends upon maintaining the integrity of railroad securities, and automobile drivers whose personal safety is endangered by excessive use of highways of heavy trucks operating for private gain.

The Program

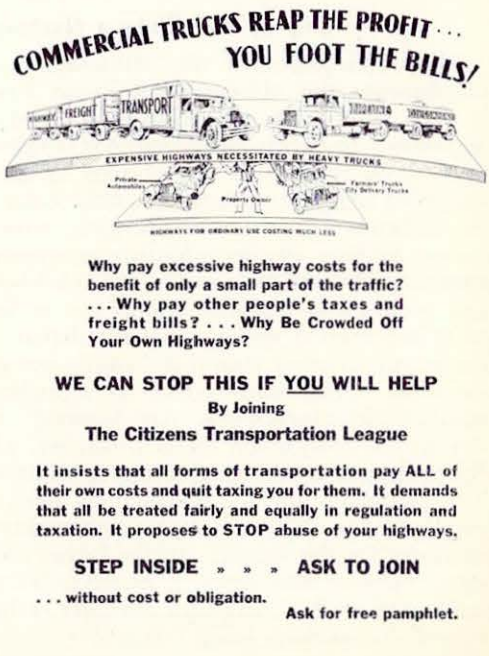
The program of the leagues is as follows:

1. Require commercially operated motor vehicles outside of the cities and towns, but not including farmers' trucks hauling farm produce, to pay (1) their full share of the cost and maintenance of streets and highways, including the repair of damages caused by them, and all of the excess costs incurred in building highways sufficiently strong and wide to accommodate heavy vehicles; and (2) reasonable real taxes. Return of surplus funds thus collected to counties, townships and municipalities for the lowering of taxes levied against city property and farms for street and county road improvements.

2. Require the owners of all commercially-operated


STOP
STOP
—being pushed off your own highways by gigantic commercial motor trucks!
STOP
—paying excessive highway costs for benefit of only a small part of traffic!
STOP
—endangering your life insurance policy by bankrupting the railways!
STOP
—paying other people's taxes and freight bills!
WE CAN STOP THIS IF YOU WILL HELP
By Joining
The Citizens Transportation League
It insists that all forms of transportation pay ALL of their own costs and quit taxing you for them. It demands that all be treated fairly and equally in regulation and taxation. It proposes to STOP abuse of your highways.
STEP INSIDE » » ASK TO JOIN
. . . . without cost or obligation. Ask for free pamphlet.

These Placards Convey the Facts to Farmers and Other Persons in Small Communities.


COMMERCIAL TRUCKS REAP THE PROFIT . . .
YOU FOOT THE BILLS!
FREIGHT
TRANSPORT
EXPENSIVE HIGHWAYS NECESSITATED BY HEAVY TRUCKS
Why pay excessive highway costs for the benefit of only a small part of the traffic? . . . Why pay other people's taxes and freight bills? . . . Why Be Crowded Off Your Own Highways?
WE CAN STOP THIS IF YOU WILL HELP
By Joining
The Citizens Transportation League
It insists that all forms of transportation pay ALL of their own costs and quit taxing you for them. It demands that all be treated fairly and equally in regulation and taxation. It proposes to STOP abuse of your highways.
STEP INSIDE » » » ASK TO JOIN
. . . without cost or obligation.
Ask for free pamphlet.

motor vehicles to provide proof of responsibility for damage to life and property that may be caused by such vehicles, or post satisfactory indemnity bonds; require drivers of such vehicles to obtain licenses which shall be issued only upon evidence of the applicant's fitness safely to operate such vehicles; provide such regulation of hours and working conditions as may be necessary to promote public safety; and provide for the inspection of all equipment for safety of employees and the public.

3. Restrict the length, width, height and load of commercially-operated vehicles to limits consistent with public safety, the preservation of our streets and highways, and the rights of the public to the full enjoyment of their roadways.

4. Provide for adequate policing of the highways and the rigorous enforcement of all laws enacted.

5. Repeal or amend long-and-short-haul laws, discriminating statutes and mileage rate laws, both state and federal, and remove all other legal barriers which prevent railways from putting rates into effect to obtain all traffic which they can profitably handle.

6. Charge tolls for the use of the Panama Canal sufficient to cover operating expenses, interest on the investment and the amortization of that investment; discontinue government investments in river projects and barge operations except where there is a reasonable assurance that the investment can be repaid with interest by tolls or taxes upon the traffic.

7. Subject all commercial transportation agencies—highway carriers, barges, coast-wise steamships, pipe lines and railways—to equal state and federal regulation of rates, service, safety, responsibility and expenses. Require a finding by a regulatory body before service can be commenced that it will be in the public interest and will not unduly impair any other important or more economical transportation service. Require that all rates be published and adhered to and authorize the regulating body to fix maximum and minimum rates which shall not be unreasonably high or lower than the actual entire cost of performing the service. Require proof of adequate responsibility or bond to protect shippers using the service. If it is found impracticable or illegal to regulate any competing forms of transportation in any of these respects, remove regulation to a corresponding degree from other forms of transportation so that every agency shall enjoy full equality in the matter of competitive opportunity.

Ship-by-Rail Clubs a Nucleus

The development of the Minnesota Citizens League supplements the Minnesota Railroad Employees Ship-by-Rail Association, which was organized at St. Paul on September 16, when more than 4,000 railroad employees who found themselves out of jobs or their employment imperiled largely as a result of traffic being diverted from the railways by unfair competition, crowded the auditorium in that city to initiate a movement to stop the spending of taxpayers' money for subsidies to waterways and commercial highway traffic and to bring all forms of transportation under equal regulation. In extending the league to other states, the employees ship-by-rail association of that state is used as a nucleus. A circular entitled "Reinforcements Are Coming" is sent by the ship-by-rail association to each member, while pamphlets for the league are distributed among all railway employees. The pamphlets include instructions designed to aid the employee in making a diplomatic approach when soliciting members for the league. In the larger cities which have many railway employees, a house-to-house campaign is conducted, with a campaign manager, colonels, captains, etc., all the workers being volunteers.

State Motor Vehicle Regulatory Legislation

Part III

PUBLICATION of data on present state laws covering the regulation and taxation of highway motor carriers is concluded herein. The compilation was prepared by the American Railway Association Committee on Relations of Railway Operation to Legislation and its publication in the *Railway Age* was commenced in the issue of January 28 when Part I appeared. Part II was published in the *Railway Age* of February 25. Data on the remaining states follow:

North Dakota

State Agency Exercising Control: Board of Railroad Commissioners. Fixes rates, fares, etc., of common carriers of passengers or freight.

Prerequisites of Operation: Certificate of public convenience and necessity. Liability and property damage insurance or surety bond in such amount as commission may prescribe—passenger and freight.

Dimensions: Length, single unit, 35 ft., combination 70 ft.; width, 8 ft.; height, 14½ ft. Weight: State Highway Commission and local authorities classify highways and limit weight of loads; for 90 days each year these general weight conditions may be changed or all loads prohibited.

Taxes: Registration fees passenger motor vehicles—2,000 lb., $12.50, 5,000 lb., $50, 8,000 lb., $110, 9,000 lb., $150. (Commercial passenger vehicles shall pay an additional fee of $7 per passenger seating capacity.) Motor trucks—1 ton, $21, 2½ ton, $70, 3 to 4 ton, $90, 4 to 5 ton, $200, 5 to 6 ton, $400, 6 to 7 ton, $600, over 7 ton, $900, 10 ton and over, $1,500. (When used for commercial freighting an additional charge of $25 per vehicle; trailers used for commercial freighting $5 per ton.)

Ohio

State Agency Exercising Control: Public Utilities Commission. Fixes rates, fares, etc., of common carriers—passenger or freight.

Prerequisites of Operation: Certificate of public convenience and necessity for common carriers of passenger or freight; liability insurance or bond for passenger carriers; cargo insurance policy or bond for property carriers in amounts satisfactory to commission.

Dimensions: Length: Single Unit, 35 ft.; combination, 85 ft.; width 8 ft.; height, 12½ ft. (A combination of vehicles consisting only of a motor power truck without loading platform and one semi-trailer, the semi-trailer of such combination may be 50 ft. long, which combination vehicle including load shall not be greater than 60 ft. over all, and no other combination of vehicles coupled together shall be greater than 85 ft.—law effective Aug. 1, 1931.) Weight: Solid tires, axle, 8 ton, gross, 10 ton; pneumatic tires—axle, 9 ton, gross, 12 ton. (Subject to reduction by highway authorities in time of thaw or moisture.)

Taxes: Registration fees for passenger carriers—7 passengers or less, operating between fixed points, $40, not fixed points, $20; 7 to 12 passengers, operating between fixed points, $90, not fixed points, $50; 12 to 18 passengers, between fixed points, $140, not fixed points, $90; 18 to 24 passengers, between fixed points, $180, not fixed points, $115; 25 passengers and over, between fixed points, $230, not fixed points, $150. Registration fees for trucks—1¾ ton or less, operating between fixed points, $40, not fixed points, $20; 1¾ to 2½ ton, between fixed points, $80, not fixed points, $50; 2½ to 3½ ton, between fixed points, $140, not fixed points, $100; 3½ ton and over, between fixed points, $200, not fixed points, $150. Trailers are assessed 20 per cent of the fees applicable to vehicles which draw them; combination passenger and property carriers pay the bus or truck rate which ever is higher.

Oklahoma

State Agency Exercising Control: Corporation Commission. Fixes rates, fares, etc., of common carriers of passenger or freight.

Prerequisites of Operation: Certificate of public convenience and necessity for common carriers of passengers or freight; bond or liability insurance in amount prescribed by Corporation Commission.

Dimensions: Width, 7½ ft.; weight, load, 15,000 lb.

Taxes: Bus registration fees—first $500 of price, $12.50, each $100 over $500, $1.50—reduction of 20 per cent each year for 3 years. Truck registration fees—1500 lb. or less, $15, 1501 to 2000 lb., $25, 2001 to 3000 lb., $40, 3001 to 4000 lb., $60, 4001 to 6000 lb., $80, 6001 to 8000 lb., $200, over 8000 lb., $300,—reduction of 20 per cent each year for 3 years. In addition to above: Class A passenger carriers (Over Regular Routes)—7 or less passengers, 3 mills per mi., 8 to 11 passengers, 5 mills per mi., 12 to 17 passengers, 7 mills per mi., 18 to 23 passengegrs, 9 mills per mi., 24 to 29 passengers, 11 mills per mi., 30 to 36 passengers, 12½ mills per mi., over 36 passengers, 15 mills per mi. (Scheduled mileage and trips, 30 days per mo.) Class B (carriers not in Class A): 7 passengers or less, flat fee, $25, and ¼ cent per mile; 7 to 16 passengers, $50 and ½ cent per mile; 17 to 25 passengers, $75, and ¾ cent per mile; over 25 passengers, $100 and 1 cent per mile. (Based on actual mileage payable monthly.) Both Class A and B also pay $100 per year to Corporation Commission. Class A property carriers (over regular route)—2/5 cent per mile (scheduled mileage) and in addition: 2,000 lb. or less, $17.50, 2,000 to 3,000 lb., $40, 3,000 to 4,000 lb., $75, 4,000 to 5,000 lb., $100, 5,000 to 6,000 lb., $150, 6,000 to 7,000 lb., $175, 7,000 to 8,000 lb., $300, 8,000 to 9,000, $350, 9,000 to 10,000 lb., $400, 10,000 to 15,000 lb., $500; Class B (not in Class A and C) ½ cent per mile based on actual mileage; Class C (hauling own property, charging or collecting from consignee or purchaser for such hauling), same as Class B. Class A and B pay $100 and Class C pays $10 to Corporation Commission.

Oregon

State Agency Exercising Control: Public Utilities Commissioner fix rates, fares, etc., of common carriers of passengers or freight.

Prerequisites of Operation: Motor carriers (passenger and freight) must obtain permit to operate; must file with Commissioner liability and property damage insurance policy and inland insurance policy in such

sums as Commissioner may deem necessary; or in lieu of such insurance the motor carrier may file certified check or checks, or obligations of the U. S. Government. Freight motor carriers must, in addition, file a bond in a sum of not less than $2500 for protection of shippers and consignees. The Commissioner may also require "a good faith bond" conditioned upon payment of all State fees and "faithful carrying out" of the permit to operate.

Dimensions: Length, single unit, 34 ft., combination, 65 ft. After January 1, 1933, 50 ft.); width, 8 ft.; height, 11 ft. Weight, one wheel, 8,500 lb., one axle, 17,000 lb., gross (one or more vehicles), 49,000 lb.

Taxes: Annual license or registration fees range from $10 for vehicles weighing 1,700 lb. or less to $1.10 per 100 lb. or fraction thereof for vehicles weighing over 4,500 lb. Passenger Vehicle Taxes: (a) Operating on regular routes between fixed termini, ½ mill per passenger seat mile, allowing 20 inches seating space for passenger; (b) operating on call—vehicles of light weight of less than 4,500 lb., a tax of 50 per cent of the regular license tax fee—vehicles above that weight,—100 per cent of such fee. Common carrier freight vehicle taxes. (a) Operating on regular routes between fixed termini,—1 mill per ton mile; (b) operating on call—vehicles of light weight of less than 4,500 lb., a tax of 50 per cent of the regular license tax fee—vehicles above that weight, 100 per cent of such fee. Common carrier combination passenger and freight vehicle taxes: 1/6 mill per passenger mile plus ⅓ mill per ton mile.

Pennsylvania

State Agency Exercising Control: Public Service Commission regulates fares, rates, service, etc., of common carriers of passenger or freight.

Prerequisites of Operation: Certificate of public convenience and necessity, for common carriers of passengers or freight.

Dimensions: Length, single unit, 33 ft., combination, 70 ft.; width, 8 ft.; height, 14½ ft. Weight: Gross weight limitations for gasoline vehicles (all vehicles not electrically operated) are graduated according to chassis weights, beginning with a 4-wheel vehicle having a chassis weight of 2,000 lb. and a gross weight limit of 5,000 lb. up to the maximum weight limit of 36,000 lb. permitted for any 4-wheel or 6-wheel single unit. Electrically-operated 4-wheel vehicles are permitted a gross weight of 26,000 lb. within 18,000 lb. axle limit; electrically-operated 6-wheel vehicles are limited in gross weight to 36,000 lb. with a limit of 8,000 lb. on the front axle and 16,500 lb. on each rear axle. Two-wheel semi-trailers are limited to 18,000 lb.; 4-wheel trailers to 26,000 lb.; 6-wheel trailers to 36,000 lb.; a tractor-semi-trailer combination to 39,000 lb. within an axle limit of 18,000 lb.; a truck-trailer combination to 62,000 lb.; and a tractor-semi-trailer-trailer combination to 65,000 lb.

Taxes: Intra-state passenger and property carriers are assessed a gross receipts tax from which excise taxes paid to any Pennsylvania community may be deducted; interstate carriers (with the same deduction privilege) pay this gross receipts tax on that proportion of their business which is conducted in Pennsylvania. In addition, bus registration fees for vehicles equipped with pneumatic tires are as follows: 5 passenger or less, $25; 6 to 8 passengers, $30; 8 to 26 passengers, $40 plus $4 for each seat in excess of 7; over 26 passengers, $40 plus $4 for each seat, 8 to 26 inclusive, plus $10 for each seat in excess of 26; in excess of 53 passengers, $300 when operated exclusively in cities. Registration fees for trucks not electrically operated are graduated in accordance with chassis weights and types of tires; a 4-wheel vehicle with a chassis weight less than 2,000 lb. pays $16.50 if equipped with pneumatic tires, $28 if equipped with solid tires and $25 if equipped with cushion tires; a 4-wheel or 6-wheel vehicle with a chassis weight of 12,000 lb. or more pays $225 if equipped with pneumatic tires, $350 if equipped with solid tires and $275 if equipped with cushion tires. Registration fees on electrically operated trucks are graduated from the $16.50 charged the 4-wheel vehicles of more than 5,000 lb. gross weight to the $225 charged the 6-wheel vehicle of 36,000 lb. gross weight. Trailers and semi-trailers, like non-electric trucks, are assessed on the basis of chassis weights and types of tires; a 2-wheel semi-trailer of less than 1,000 lb. chassis weight pays $5 if equipped with pneumatic tires, $6 if equipped with cushion tires and $8 if equipped with solid tires; a 6-wheel trailer of 9,000 lb. or over chassis weight pays $100 if equipped with pneumatic tires, $125 if equipped with cushion tires and $150 if equipped with solid tires.

Rhode Island

State Agency Exercising Control: Public Utilities Commission fixes routes, fares, speed, schedules and prescribes rules for the convenience and safety of passengers and public. There is no regulation of trucks.

Prerequisites of Operation: Certificate of Public Convenience and necessity; approval of city or town where terminal is located. Bond on buses of $500 for each passenger. (If financial responsibility is satisfactory, no bond necessary.)

Dimensions: Length, combination, 85 ft.; width, 8½ ft.; height, 12½ ft. Weight, not to exceed 28,000 lb. (including load); 6 wheels, 3 axles—not to exceed 40,000 lb. (including load).

Taxes: In addition to registration and license fees—city or town tax on equipment where vehicle registered; also gross earnings tax.

South Carolina

State Agency Exercising Control: Railroad Commission fixes rates, fares, etc., of common carriers of passengers or freight.

Prerequisites of Operation: Certificate of public convenience and necessity; indemnity bond or liability insurance in amounts satisfactory to Commission.

Dimensions: Weight, single or in combination, 25,000 lb. gross; combination of vehicles operated as a unit, 40,000 gross; no vehicle can exceed by more than 30 per cent rated capacity as indicated by license plate.

Taxes: Passenger carriers operating over regular routes (Class A and B carriers) are assessed on the basis of weight and seat miles; solid-tired vehicles of less than 7,000 lb. weight and pneumatic-tired vehicles of less than 13,000 lb. pay 1/50 cent per seat mile; solid-tired vehicles of more than 7,000 lb. and pneumatic-tired vehicles over 13,000 lb. pay 1/40 cent per seat mile. (The following minimum fees apply in connection with the seat mile tax: vehicles of 7-passenger capacity, $30; 8 to 12 passengers, $40; 13 to 17 passengers, $50; 18 to 22 passengers, $60; 23 to 27 passengers, $75; over 27 passengers, $90. Class C passenger carriers (providing special trip services) are assessed on the basis of weight—2,000 lb. or less, $15, over 2,000 lb., $15 plus $5 for each additional 500 lb. Trucks operating over regular routes (Class D carriers) are assessed ton-mile taxes as follows: Vehicles of 3 ton or less gross weight, ⅛ cent per ton-mile; 7-ton pneumatic-tired vehicles or 3 to 5-ton solid-tired vehicles, ¼ cent per ton-mile; 9-ton (pneumatic) or 5 to 8½ ton (solid), ½ cent per ton-mile. (The following minimum fees apply to pneumatic-tired vehicles in connection with the ton-mile tax: One ton, $25; 1 to 2 ton, $50; 2 to 3 ton, $100; 3 to 4 ton, $150; 4 to 5 ton, $250. Minima for solid-tired vehicles are double these amounts.) Trucks of Class E and Class F (trucks not operating over regular routes and contract trucks) are assessed on the basis of weight as follows: 1½ ton, $30; 1½ to 2 ton, $60; 2 to 3 ton, $120; 3 to 4 ton, $200; 4 to 5 ton, $400. (Rates doubled for solid-tired vehicles.)

South Dakota

State Agency Exercising Control: Board of Railroad Commissioners fixes rates, fares, etc., of common carriers of passengers or freight.

Prerequisites of Operation: Certificate of authority; bond or indemnity insurance in amounts prescribed by Commission.

Dimensions: Length, including trailer, 50 ft.; width, 8 ft.; height, 12½ ft. Weight, gross, 20,000 lb., axle, 16,000 lb.

Taxes: Passenger carriers—less than 2,000 lb., $13; 6,000 lb. and over $75; also, each passenger in excess of seven, $8. Trucks: 1,500 lb. or less, $15; 4251 to 4500 lb., $100; 4501 to 5000 lb., $125; 5001 to 5500 lb., $150; 5501 to 6000 lb., $175; 6001 to 6500 lb., $200; 6501 to 7000 lb., $225; 7001 to 7500 lb., $250; 7501 to 8000 lb., $300; 8001 to 8500 lb., $350; 8501 to 9000 lb., $400; over 9000 lb., $100 for additional 100 lb. or fraction. Trailers: Up to 750 lb., $1; 750 to 1250 lb., $5; 1251 to 1500 lb., $20; 1501 to 2000 lb., $30; 2001 to 2500 lb., $50; 2501 to 3000 lb., $75; 3001 to 3500 lb., $100; 3501 to 4000 lb., $150; 4001 to 5000 lb., $250; 5001 or over, $500.

Tennessee

State Agency Exercising Control: Public Utilities Commission fixes rates, fares, etc., of common carriers of passengers or freight.

Prerequisites of Operation: Certificate of public convenience and necessity for common carriers of passengers or freight; liability bond in amounts prescribed by Commission covering personal injury and property damage.

Dimensions: Width, 8 ft. Weight: Per inch tire width, 650 lb. The only regulation as to weight is Chapter 130 of the 1925 Public Acts, which does not apply to several named counties. Limits the gross loads to 20,000 lbs. There is some question as to the validity of this Act.

Taxes: Passenger vehicle registration fees—per h.p., 50 cents, per seat, $2. Trucks: per h.p., 50 cents, and, in addition—½ to 1½ ton capacity, $10 per ton, 2½ to 3½ ton, $20 per ton, 4 to 4½ ton, $30 per ton, 5 to 5½ ton, $40 per ton, 6 tons and each ton in excess, $50 per ton. Trailers: ½ to 2 ton, $7.50, 2½ to 3½ ton, $10, 4 to 4½ ton, $15, 5 to 5½ ton, $20, 6 tons and each ton in excess, $25. In addition to above: Buses—7 Passengers or less, ¼ cent per mi.; 8 to 20 passengers, ½ cent per mi.; 21 to 23 passengers, ¾ cent per mi.; more than 23 passengers, 1 cent per mi. Trucks—over 1½ ton to 3 ton capacity, ½ cent per mi; 3 to 5 ton, 1 cent per mi.; 5 to 8 ton, 3 cents per mi.; 8 tons, 5 cents per mi.

Texas

State Agency Exercising Control: Railroad Commission fixes rates, fares and charges of passenger and freight common carriers; prescribes minimum rates, fares and charges of contract carriers of property which shall be not less than the rates prescribed for common carriers.

Prerequisites of Operation: Certificate of public convenience and necessity for common carriers of passenger and freight; permit for contract carriers of freight; bonds or insurance policies in amounts fixed by Commission for common and contract carriers.

Dimensions: Length, single unit, 35 ft.; combination, 45 ft.; width, 8 ft.; height, 12½ ft. Weight: Load, 7,000 lb. single or combination when loaded in containers, boxes or binding, containing more than 30 cu. ft. and weighing more than 500 lbs.; 600 lb. per in. of tire width.

Taxes: Passenger carriers (rates per 100 lb. gross weight)—Up to 4,000 lb., pneumatic tires, $1.10, solid tires, $1.25; 4,001 to 6,000 lb., pneumatic, $1.15 solid, $1.40; 6,001 to 8,000 lb., pneumatic, $1.30, solid, $1.50; 8,001 to 16,000 lb., pneumatic, $1.40, solid, $1.60; 16,000 to 24,000 lb., pneumatic, $1.40, solid, $1.75; 24,000 to 28,000 lb., pneumatic, $1.40, solid, $2; 28,000 and over, $4, solid, $6. Six-wheel vehicles, gross weight 26,001 to 30,000 lb., pay $1.60 per 100 lb. (pneumatic) and $2 per 100 lb. (solid tires). "Gross weight" includes 150 lb. per passenger seat. In addition to the above $10 per vehicle and $1 per passenger seat. Trucks (rates per 100 lb. gross weight)—up to 6,000 lb., pneumatic tires, 40 cents, solid tires, 50 cents; 6,001 to 8,000 lb. pneumatic, 50 cents, solid, 60 cents; 8,001 to 10,000 lb., pneumatic, 60 cents; solid, 70 cents; 10,000 to 12,000 lb. pneumatic, 70 cents, solid, 90 cents; 12,001 to 14,000 lb., pneumatic, 80 cents, solid, $1; 14,001 to 16,000 lb., pneumatic, 90 cents, solid, $1.20; 16,001 to 22,000 lb., pneumatic, $1.30, solid, $1.50; 22,001 to 26,000 lb., pneumatic, $1.60, solid, $2; 26,001 and up, pneumatic, $4, solid. $5. In addition: Class A (over regular routes) $15 per year for each vehicle. Class B (not over regular routes) $10 per year for each vehicle.

Utah

State Agency Exercising Control: Public Utilities Commission fixes rates, fares, etc., of common carriers, passenger or freight.

Prerequisites of Operation: Common carriers must secure certificate of public convenience and necessity and file public liability and property damage insurance and bond for payment of taxes. Contract carriers for more than one person, etc., must secure permit and file insurance and bond same as common carriers.

Dimensions: Length, single unit, 33 ft., combination, 85 ft.; width, 8 ft.; height, 14 ft. Weight, 1 axle, 18,000 lb., 2 axles 26,000 lb., 3 axles, 34,000 lb.

Taxes: Registration fees for passenger vehicles equipped with pneumatic tires—25 h.p. or less, $5; 25 to 40 h.p., $7.50; 40 to 50 h.p., $10; over 50 h.p., $12.50. Motor truck registration fees: One ton capacity, pneumatic tires, $10, solid rubber tires, $25, metal tires, $40; 1½ ton, pneumatic, $15; solid, $35, metal, $50; 2 ton, pneumatic, $22.50, solid, $50, metal, $80; 2½ ton, pneumatic, 30 solid, $65; 3 ton, pneumatic, $40, solid, $75; 3½ ton, pneumatic, $55, solid, $100; 4 ton, pneumatic, $70, solid, $125; 4½ ton, solid $130; 5 ton, pneumatic, $100. solid, $140; over 5 ton, 5-ton rates plus $50 for each ton in excess. Trailer and semi-trailer registration fees: One ton capacity or less, pneumatic tires, $10, solid rubber tires, $15; 1 to 2 ton, pneumatic, $15, solid, $25; 2 to 3 ton, pneumatic, $25, solid, $40; 3 to 4 ton, pneumatic, $40, solid, $60; 4 to 5 ton, pneumatic, $50, solid, $75; trailers equipped with metal tires—½ ton capacity, $15, one ton, $25, two ton, $50. In addition to the foregoing registration fees: For freight service of any kind operators must pay 2/3 cent per ton mile on hard surfaced roads and ¼ cent per ton mile on all other roads. For passenger service of any kind operators must pay 2½ mills per passenger mile on hard surfaced roads and 1 mill per passenger mile on all other roads.

Vermont

State Agency Exercising Control: Public Service Commission fixes rates, fares, etc.

Prerequisites of Operation: Certificate of public convenience and necessity; bond or insurance policy to be furnished for passenger carrying vehicles, amount to be fixed by Commission.

Dimensions: No restrictions regarding buses; trucks and trailers, 8 ft. in width and 12 ft. in height. Weight, 16,000 lb.
Taxes: Registration fees only for passenger vehicles and trucks.

Virginia

State Agency Exercising Control: State Corporation Commission has general power to regulate, fix rates, fares, charges, prescribe rules, etc., for common carriers, passenger and freight.
Prerequisites of Operation: Certificate of public convenience and necessity for intra-state common carriers, both passenger and freight. Liability insurance or surety bond covering personal injuries and property damage in the amount and form prescribed by the Commission.
Dimensions: Length, single unit, 33 ft., combination, 45 ft. (exclusive of coupling); Highway Commission may permit those now operating combinations in excess of 45 ft. to operate not more than two such vehicles, or not more than three, if the gross weight of the combination does not exceed 20,000 lb., until April 1, 1934; width, 8 ft.; height, 12½ ft. Weight: 16,000 lb. on one axle, 650 lb. per in. width of tire; 4-wheel vehicle, 24,000 lb. gross; 6-wheel vehicle or combination of vehicles 35,000 lb. gross, but must not exceed 16,000 lb. on any one axle.
Taxes: Filing fee with application for certificate of convenience and necessity, $25; license fees for buses—70 cents per 100 lb. manufacturers shipping weight; common carrier buses also pay 2 per cent of gross receipts in this state. Common carrier trucks 70 cents per 100 lb. on weight of chassis plus manufacturers rated carrying capacity; also, 2 per cent on gross receipts in this state. Alternative taxes provided on interstate common carrier buses and trucks on weight-mile basis in event both taxes declared unconstitutional. All resident trucks, other than common carriers, and non-resident if exceeding three trips per month (unless such non-resident excused by reciprocity provision) pay a license fee based on capacity scaled from 1 ton, $15.00, to 10 ton, $1150. Alternative taxes provided for non-resident trucks on weight-mile basis in event the above taxes are declared unconstitutional as to them. Trailers and semi-trailers pay one half fee of trucks of like capacity. Contract or for-hire trucks pay one and one-half times the taxes on private trucks of like capacity.

Washington

State Agency Exercising Control: Department of Public Works fixes rates, fares, etc., of common carriers of passengers or freight.
Prerequisites of Operation: Certificate of public convenience and necessity. Liability and property damage insurance.
Dimensions: Length, single unit, 35 ft., combination, 85 ft.; width 8 ft.; no vehicle or combination having more than 6 axles allowed on public highways. Weight: 4-wheels, 2 axles, axle weight, 18,500 lb., gross, 24,000 lb.; 3 axles, gross, 42,500 lb.; 4 axles, axle weight, 12,000 lb., gross, 48,000 lb.; 6-wheels, 3 axles, axle weight, 11,000 lb., gross, 27,500 lb.; 1-axle trailer, trailer axle weight, 18,000 lb.; 6-wheel truck with 4-wheel, 2-axle trailer, axle weight, 12,000 lb., gross, 54,000 lb.; 6-wheel truck with 6-wheel-3-axle trailer, gross, 60,000 lb.
Taxes: All applications for a certificate of public convenience and necessity must be accompanied by an application fee of $25, one per cent of the gross operating revenues of all common carrier vehicles. (This tax is not in lieu of the regular property tax); also, passenger buses—$3 per seat; freight trucks and trailers—50 cents per 100 lb. or fraction thereof on the maximum load carried. (In the event the freight truck or trailer is propelled by a fuel on which no excise tax is charged, an additional fee of 50 cents per 100 lb. shall be charged on the vehicle's gross weight.)

West Virginia

State Agency Exercising Control: State Road Commission fixes rates, fares, etc., of common carriers of passengers or freight.
Prerequisites of Operation: Certificate of public convenience and necessity; bond or insurance policy to be furnished for passengers and freight in amounts to be fixed by Commission.
Dimensions: Length, single unit, 40 ft., combination, 60 ft.; width, 7½ ft.; height, 12 ft.; weight, gross, 20,000 lb.
Taxes: In addition to registration and license fees, passenger carriers for hire between fixed termini over regular routes pay 1/15 cents per seat mile—minimum fee, $75. Property carriers for hire between fixed termini or over regular routes are assessed as follows: 3 ton or less capacity, ¼ cent per ton-mile; over 3 ton 1/3 cent per ton-mile.

Wisconsin

State Agency Exercising Control: Public Service Commission fixes rates, fares, etc., of common carriers, passenger or freight; contract carriers must keep daily record of their operations as prescribed by the Commission for purpose of levying taxes.
Prerequisites of Operation: Certificate of public convenience and necessity for common carriers of passengers or freight; permit for contract carriers of freight; single units or combination of units not exceeding 3 tons excepted; bond for transportation of passengers.
Dimensions: Length, single unit, 33 ft.; combination, 60 ft.; width, 8 ft. Weight: On Class A highways—4-wheel vehicles, gross weight 24,000 lb.; 6-wheels or more, gross weight 36,000 lb.; 2-wheel trailers, gross, 19,000 lb.; trailers of 4 or more wheels, gross, 24,000; on Class B highways—4-wheel vehicles, gross, 15,000 lb.; 6 wheels or more, gross, 22,500 lb.; 2-wheel trailers, gross, 12,000 lb.; trailers of 4 or more wheels, gross, 15,000 lb.; gross weight on any one wheel limited to 800 lb. per sq. inch of tire; gross weight on any one wheel limited to 9,500 lb. on Class A highways and 6,000 lb. on Class B highways.
Taxes: Truck license fees—1½ ton or less, $10; 1½ to 2¼ ton, $15; 2¼ to 3 ton, $20; 3 to 4 ton, $35; 4 to 5 ton, $60; over 5 ton, $60 plus $25 for each ton or fraction in excess of 5 ton; trailers and semi-trailers weighing in excess of 3,000 lb., gross, are assessed one-half the foregoing truck fees. Passenger vehicles, operated intra-city, with capacity in excess of 7 passengers are assessed three times the fees of trucks of the same gross weight; gross weight includes 150 lb. per 20 in. of seat space including driver's seat. Inter-city buses are assessed 25 per cent more than intra-city passenger vehicles. Certificated carriers pay an application fee ($25) plus $40 per vehicle and ton-mile taxes in addition. All certificated passenger vehicles equipped with pneumatic tires are assessed 1 mill per ton-mile and, if equipped with two or more solid tires, 2 mills per ton mile on mileage operated outside cities and villages. Certificated trucks, equipped with pneumatic tires, are assessed ton-mile taxes as follows: Less than 7 ton capacity, 1 mill per ton-mile; 7 to 8 ton, 1⅛ mills per ton-mile; 8 to 9 ton, 1¼ mills per ton-mile; 9 to 10 ton, 1⅜ mills per ton-mile; 10 to 11 ton, 1½ mills per ton-mile; 11 to 12 ton, 1⅝ mills per ton-mile; 12 to 13 ton, 1¾ mills per ton-mile; 13 to 14 ton, 1⅞ mills per ton mile; over 14 ton, 2 mills per ton-mile; for trucks equipped with two or more solid tires the foregoing rates in each weight class are doubled.

Wyoming

State Agency Exercising Control: Public Service Commission regulates rates and charges, of common carriers, passenger or freight.
Prerequisites of Operation: Certificate of public convenience and necessity for carriers operating over regular routes and between fixed termini, annual permit for contract carriers and interstate carriers. Insurance policy in amounts fixed by the Commission for protection of passengers, cargo and public.
Dimensions: Length, single unit, 40 ft.; combination, 85 ft.; width, 8 ft.; height, 12½ ft. Weight: Gross, 30,000 lb.; 1 axle, 18,000 lb. (2 or more axles within 40 in. treated as one axle); 700 lb. per in. width of tires on any one wheel.
Taxes: In addition to registration and license fees—annual fee for certificate or permit, $15; fee for transfer of certificate or permit, $5. Fees as compensation for use of highways: Freight or express service, 2 mills per ton-mile; passenger service, ½ mill per passenger-mile.

Railroads Oppose Reductions in Freight Rates

WASHINGTON, D. C.

DENYING the authority of the Interstate Commerce Commission, under existing laws, to require a general reduction in freight rates on basic commodities, as proposed in a "memorial petition" filed with the commission by the National Coal Association, the National Lumber Manufacturers' Association and three farm organizations, the Association of Railway Executives has filed an answer urging the commission to deny the petition and asserting that the investigation proposed by the petitioners would be unjustified and useless.

To take action still further depriving the carriers of the fair return due under Section 15a, the railroad answer says, "as would be done if the result of the proposed reduction in rates was a reduction in revenues," would be in direct violation of the requirements of Section 15a of the interstate commerce act, of Section 500 of the transportation act, and of the policy of Congress as indicated in the Hoch-Smith resolution, "which provides that nothing shall be done incompatible with the continuance of adequate and efficient transportation." An order based on the prayer of the petition, the answer states, "would be merely the inauguration of an experiment involving the revenues of the carriers and the public welfare of a magnitude and with consequences which no one can adequately foresee;" and after referring to the number of roads not earning their fixed charges it says that "if anything is done to increase their difficulties—in fact, unless substantial steps are taken for their relief—the consequences to the carriers themselves and to every individual and business interest in the country will be simply appalling."

"The introductory statement of the petition is to the effect that since the beginning of the depression the cost of transportation by rail has not declined correspondingly with the decline in prices of commodities; and virtually all the matters of fact set forth in the petition consist of illustrations, amplifications and dramatizations of this general statement. While it is doubtless true that the relation of the general level of freight rates to the general level of commodity prices is a factor which is entitled to consideration in the determination of what rates are reasonable, such relationship standing alone furnishes no sufficient standard of reasonableness, and the petition makes no other allegations of fact bearing upon the reasonableness of existing rates. In it no appropriate consideration is given to the revenue needs of the carriers, the extremity of which in many cases is a matter of common knowledge and peculiarly within the knowledge of this commission; and such a vital question as the relation of rates to the cost of service is not mentioned or dealt with.

"Other important and essential factors bearing on the question are likewise passed over in silence. Particularly striking is the failure to give recognition to the fact that almost the entire rate structure of the country has been reviewed by the commission in recent years, or is now being reviewed, first, by commodities, in the Hoch-Smith investigation; second, by traffic regions, in the several class rates and similar investigations; and, third, nationally, in the *Fifteen Per Cent Case, 1931, supra,* and supplementary investigations. The suggestion is made that transportation costs might be lowered by further operating economies, but no reference is made to the fact that the question of such economies is now being considered in the general investigation by the commission in *Ex Parte No. 104,* nor to the fact that the only large scale economies that could be effected would be by means of wage reductions, which are not within the jurisdiction of the commission, or by the discharge or furlough of employees, and this all industry is seeking a method of avoiding.

"The rate adjustment of the carriers is in the petition contrasted with that of carriers using highways and waterways, with no reference to the many essential differences in the conditions under which these different types of carriers respectively operate. In this connection the statement is made that the rail carriers have in specific instances reduced rates to meet the competition of these carriers, and it is alleged that this has operated detrimentally; but, instead of urging the extension of governmental regulation over the unregulated carriers, the remedy proposed is apparently for the railroads in all cases to reduce rates to the level which it has been necessary in certain cases for them to adopt in order to meet this unregulated and subsidized competition. It is interesting to note that the instances in which such reductions have been made are exempted by the prayer of the petition from the general prayer for rate reduction."

Reorganization Law in Effect

(Continued from page 362)

zation provisions had been attached as a rider. It had been previously passed by the House. This empowers the President to transfer the whole or any part of any executive agency or its functions to the jurisdiction and control of any other executive agency, to consolidate the functions vested in any executive agency, or to abolish the whole or any part of any executive agency or its functions.

Both Houses of Congress passed and the President signed on March 4 the Copeland bill requiring carriers operating in intercoastal service through the Panama canal to file rate tariffs with the Shipping Board which may not be changed except upon special authorization on less than 30 days' notice.

Some progress was made in the last session toward a reduction in federal appropriations for river and harbor improvements and for contributions to state highway construction and no general rivers and harbors authorization bill was considered, but the general necessity for economy was given as the reason rather than any change in policy. Some reduction in the appropriation for air-mail service was effected in the conference report on the Treasury-Postoffice bill, which as finally passed included only $15,000,000 for this purpose in place of the $19,000,000 figure originally adopted by the House which the Senate had attempted to eliminate entirely.

Communications . . .

Is Passenger Department Being "Coddled"?

CHICAGO.

TO THE EDITOR:

In one respect, I believe I may be permitted one loud, "I told you so!" New York newspapers and business magazines have recently carried special articles and editorials about the new lunch-counter-car lately installed on the New Haven. If my memory serves me correctly, a letter of mine was published in this column April 16, last, setting forth a number of features of present passenger-service which must, in my opinion as an observer and patron of railroads, be thoroughly reorganized if the rails are ever to place their passenger service upon a profitable basis. Among the specific suggestions was that of a sort of sandwich shop on wheels, designed and equipped to serve a limited variety of simple food at greatly reduced prices.

In the April 30 issue there was a letter from a "high passenger-traffic official" in answer to my criticisms, in which the author neatly disposed of the question by categorically denying every charge. He said, "We have to adopt the kind of dining car service that appeals to the majority of our patrons, but we send cold sandwiches and coffee through the train and serve the 75 per cent of the passengers who will not enter the diner." Think of it! The inconsistency of such an argument. Since when has 25 per cent constituted a majority, even in these queer times? Why not adopt the kind of service that will draw the 75 per cent and let the others drift, if necessary. The New Haven's counter-car is the answer, at least to the problem of dining-car service on short runs.

But let us not get lost in a discussion of superficial details and delude ourselves with the thought that lost passenger traffic can be won back by trifling changes. No, indeed. Too many railroad traffic officers are still basking in the sunshine of the 1890's, and the passenger-traffic policies are 30 years behind time in too many important re- ts for any cure to be effected by half-hearted remedies.

A Soda-Fountain in the Lounge-Car

I do not say that the railroads or that railway operating men stopped growing 30 years ago. Nowhere in the remarkable record of technical advance in American industry since 1900 can there be found a more striking increase in operating efficiency or a comparable degree of mechanical excellence than in railway operation. But while the motive-power men have given us locomotives that can pull 30-car trains over the mountains, and the right-of-way men have given us a roadbed that will safely support these locomotives at high rates of speed after two years of inadequate maintenance, and while the train-service men have given us "main-trackers" that land Jersey City freight in Buffalo in 12 hours instead of 36, and habitually get 9,000 miles per month out of locomotives; while these men have managed to anticipate their problems and to keep one jump ahead of them, the passenger-traffic men have put a soda-fountain into the lounge-car!

The three major objectives toward which these men should work, a faster and more comfortable journey, a lower cost for fare and other incidentals, and above all, alert and up-to-the minute publicity technique, are in most respects exactly where they were when Dewey took Manila. Standards of coach-construction have advanced greatly, it is true, but the improved cars are never used on the secondary trains where the greatest loss of patronage has occurred, and their advantages are defeated by the stagnation in the other two fields in any case. The stampede of producers to give the public more of everything at constantly decreasing cost has left passenger-men cold.

But it is in the matter of publicity-technique that the most disheartening example of suspended animation is to be found. Merchandising instinct seems to be completely dead. Here in this day of savage competition for public favor, when every slight whim of the people is instantly seized by alert publicity experts and capitalized upon for the benefit of some producer, when the public has become accustomed to being driven into a

desire for a thing and has grown to expect such a display by anyone who has anything to sell them; even when this condition exists and it is plainly evident that railroad-service must be *sold*, the knack of self-advertising just isn't there.

Many Opportunities for Merchandising

This is all the more amazing when it is considered that the railroads have opportunity hammering at their doors, that they have two advantages of immeasurable value over any other great industry with something to sell. In the first place, there is the vast city real-estate property of the roads, advertising locations, thousands of places to tell their story with no cost but paint and electric current. Secondly, and greater still, any sort of publicity-work by the railroads plays to a waiting and intensely receptive audience, the most remarkable example of latent public "fan" interest in the history of advertising. There is not a normal, sane man alive who has not been acutely locomotive-conscious since the day he was born. What wouldn't the tobacco companies give for such a foundation to build upon! The compelling advertising-technique that could be worked out around the romance and fascination of the railroad life could crystallize this universal but dormant appeal overnight. But nowhere has the effort been made.

Many instances can be seen on every side in which traffic departments have completely muffed valuable opportunities to popularize their companies. Why is it so impossible for them to take their problems by the horns as the mechanical and operating men have done with theirs, and produce some really significant changes? Will they never look the truth in the face and admit that the 10-year decline in passenger and l. c. l. freight traffic is a direct reflection upon their own methods and ability; that the steady drift away from the rails is not mere cussedness on the part of a stupid public, but is a natural and inevitable result of their own failure to grow with the times and to anticipate events and offer to the public the service which it demands? How long are railroad executives and railway publications such as *Railway Age* going to coddle them along and tell them that all will be well in the end and that the public is just stupid and perverse and that the I. C. C. is to blame for it all?

ROLAND E. COLLONS.

Put "Can't-Be-Done" on the Scrap Heap

ST. LOUIS, MO.

TO THE EDITOR:

In your January 7 issue, there appeared a letter headed "Would This Happen in a Bus Office?" It could have happened in a bus office, because human nature is not confined to the railroad business; it does not seem possible to overcome the inertia of some kinds of people.

Only about two months ago, in the ——— station in Chicago, I asked a man at the ticket window for a certain railroad folder. He suggested that I go to the other end of the row of windows and ask another man. I went to the other end, and it happened that this other man was answering the telephone and looking up information for some one. It was not a busy afternoon, and I was the only person at the windows, so to satisfy myself I patiently waited until either one of the two men would be gracious enough to deliver the folder. The man answering the telephone saw me at the window, and in an interval when he put down the receiver to look in a rate book I asked him to hand me the folder, which was within six inches of his right elbow, but he paid no attention. Finally after waiting 15 min., I walked back to the first man, told him who I was and suggested that it might be a good idea to let me have the folder. If I had not been a railroad officer, I don't know if I ever would have gotten it.

Another instance: A man unfamiliar with train service between St. Louis and Chicago inquired of a ticket agent at the Union station in St. Louis as to a train to Chicago. He was given the names of two railroads. He asked the ticket agent which was the better, and the ticket agent replied that it did not make any difference. Another man standing nearby overheard the conversation and suggested to the prospective passenger that, as there were four railroads operating between St. Louis and Chicago, it did make a difference, depending on where he was going. It happened that the man was going to a certain hotel located within three blocks of one of the railroad stations. The other roads would have landed him much farther from his destination. This is another example of dismal indifference.

As an officer in another department of railroading, looking from the inside at the attitude of railroad passenger traffic men, it occurs to me that they themselves are responsible in large measure for the continued falling off in railroad passenger travel. Their attitude is not quite as advanced as the one attributed to Commodore Vanderbilt, but is somewhat akin to it in many cases; and I am not referring particularly to the two instances mentioned above, although these do not help, by any means, to keep the public friendly to the railroads.

Take, for instance, the week-end excursion rates that are now run between many cities. In most cases two rates are quoted, a low rate good only in coaches, and a higher rate for tickets which are honored in Pullman cars. The passenger agents don't seem to be able to sense the resentment of the public at an arrangement of this sort. The Pullman passenger feels that if he is paying the Pullman fare, plus a surcharge, to ride in Pullman and parlor cars, he should not, in addition, be required to pay a higher railroad fare. As a result, one riding on trains where these rates are effective will find the coaches comfortably filled and almost no one in the Pullman cars.

The truth of the matter is that railroad passenger rates will have to be revised downward, and railroad passenger service will also have to be revised, to meet modern conditions. What people traveling are really interested in is frequent and rapid service; they are far less interested in elaborate parlor cars, magazine racks, and beautiful blue writing paper with the railroad's crest on it. What they want is high speed and greater frequency. The internal-combustion cars that are being developed, with one- or two-car trains, appear to be a solution of the problem, but one which the passenger agents are not welcoming so far with open arms. The passenger is not interested in long, heavy trains that buck and jerk trying to get started, that take a long time to accelerate and a long time to decelerate. What he wants is to be able to go to a railroad station and take a light, rapid car that gets him to his destination in the minimum time. He wants exactly the kind of service that he gets on a good city street car or bus system, where, if he misses one car, he has to wait only a short time for another. These light units could make frequent stops in big cities and make more frequent stops between cities, with rapid acceleration and deceleration, such as street cars or buses permit. It is silly to run long, heavy trains for comparatively short distances, with scattered people that could be put in one or two small cars. Rates should be so fixed as to attract passenger traffic to the railroads, and should be backed up by rapid and frequent service.

The days of leisurely travel are over, and the railroads must recognize it. For long, cross-country trips, parlor cars and lounge cars are unquestionably necessary and attractive, but on short trips, such as between St. Louis and Chicago, St. Louis and Kansas City, New York and Boston, and distances of that general sort, there is little necessity for formal luxury; the truth of the matter is that few persons want it and appreciate it. What they want is to get from where they are to where they are going in the shortest possible time and *at the time they wish to go.*

Passenger men will, of course, hold up their arms in horror at any such revolutionary idea as changing from long, heavy trains to light, rapid units. They have been holding up their arms in this kind of horror for a couple of generations. It occurs to me that it is time to relegate the "can't-be-done" idea to the scrap heap and meet modern conditions face to face.

There are devices on the market with which tickets can be sold on trains and accurate records kept. Bus companies do it; why not railroads? Why force a man to go to a railroad station if you can arrange to pick him up on a street corner in the suburbs? These things can be worked out, and they will be worked out; if the present passenger people won't do it, they will wake up some morning and find that a new set of men are doing it.

CASCARA FOR PASSENGER AGENTS.

NEWS

Freight Credit Rules Cover Bank Holidays

Situation, found by I. C. C. to require no modification of present regulations

After conferences between representatives of the Interstate Commerce Commission and of the railroads and in response to numerous inquiries as to the effect of the moratoriums and bank holidays upon the collection of freight charges, the commission on March 6 issued a notice to the public stating that it considers that such bank holidays are legal holidays within the intendment of its rules governing the extending of credit for freight charges and that the conferences had indicated that no amendment or modification of the existing credit rules was necessary or would be helpful at the present time.

The notice pointed out that as a general rule the carrier has the option to demand payment of freight in advance or on delivery; but may within reasonable and nondiscriminatory limits waive its rights to prepayment or to retain the goods until payment has been made. By section 3 of the interstate commerce act, no carrier by railroad subject to the Act shall deliver or relinquish possession at destination of any freight transported by it (government freight excepted) until all tariffs, rates, and charges thereon shall have been paid, except under such rules and regulations as the commission may from time to time prescribe to govern the settlement of all such rates and charges, and to prevent unjust discrimination. The following portions of the rules prescribed by the commission bear upon this subject:

"The carrier, upon taking precautions deemed by it to be sufficient to assure payment * * * may relinquish possession and may extend credit for a period of 48 hours * * *.

"Where retention of possession of freight by the carrier will retard prompt delivery or will retard prompt release of equipment or station facilities, the carrier, upon taking precautions * * * may relinquish possession of the freight in advance of the payment of the charges and may extend credit for 96 hours * * *.

"Sundays and legal holidays, other than Saturday half holidays, may be excluded from the computation of the periods of credit.

"The mailing by the shipper of valid checks, drafts, or money orders, which are satisfactory to the carrier, may be deemed to be the collection of the tariff charges within the credit period for the purposes of these rules. * *" *Regulations for Payment of Rates and Charges,* 171 I. C. C. 268, 281-2.

The commission also on the following day issued a similar notice expressing a similar view as to the provision for excluding legal holidays in charging for demurrage and storage.

The Difference Between Railroad and Motor Taxation

The statement of the president of a large truck manufacturing company that "the railroads paid the state $7,850,000 in 1932, whereas the trucks and buses paid $12,625,000," is so misleading in its imputations that it should not go unchallenged.

Of the $7,850,000 which the rails paid in taxes, they received back in subsidies or benefits not one dollar, while virtually all of the amount paid by the trucks and buses was spent by the state for the benefit of highway users, including the trucks. The railways paid for and maintained their own right-of-ways in addition to their payment of taxes. Trucks and buses were furnished their rights-of-ways without being called upon to spend anything for their upkeep or maintenance outside of the fees they were required to pay to the state.

The problem of rail and highway competition is too serious to be clouded by false comparisons such as this. Nothing is gained by attempting to mislead the public by the citation of comparative accounts which have no basis of similarity.

From the Grand Rapids (Mich.) Press.

Pacific Railway Club

The Pacific Railway Club will hold its next meeting on Thursday evening, March 16, at the Transportation Club, Palace Hotel, San Francisco, Cal. Chester H. Rowell will speak on the report of the National Transportation Committee.

Truckers Complain Against Express Motor Service

A formal complaint against the express motor service operated by the Railway Express Motor Transport, Inc., a subsidiary of the Railway Express Agency, Inc., has been filed with the Interstate Commerce Commission by the recently organized American Highway Freight Association. The complaint alleges that through the subsidiary, which is described as a "dummy corporation", the express company performs express service at rates very much less than those on file with the commission.

January, 1933, Net Above That for January, 1932

Total of $13,265,721 reported by Class I roads—Western lines report deficit

The net railway operating income of the Class I railroads in January amounted to $13,265,721, which for that month was at the annual rate of return of 0.92 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. This compares with $11,182,051 for January last year. Operating revenues for the month amounted to $226,555,138, compared with $272,115,638 in January, 1932, or a reduction of 16.7 per cent. Operating expenses, $181,679,761, compared with $227,032,393, a reduction of 20 per cent. Taxes paid in January totaled $22,059,490, a reduction of $1,896,242 or 7.9 per cent below the same month last year.

Seventy-three Class I railroads operated at a deficit of which 21 were in the Eastern District, 14 in the Southern and 38 in the Western.

The Eastern district reports for January $13,428,991 net, which was at the annual rate of return of 1.96 per cent. For the same month in 1932, it was $11,694,482, or 1.71 per cent. Operating revenues in the Eastern district in January totaled $118,845,730, a decrease of 16 per cent; operating expenses $89,978,431, a decrease of 20.8 per cent.

For the Southern district the January net was $3,116,551, or at the rate of 1.24 per cent. For the same month in 1932 it was $718,755, which was at the rate of 0.29 per cent. Operating revenues $31,118,924, a decrease of 11.1 per cent; operating expenses $24,436,832, a decrease of 19.7 per cent.

For the Western district January showed an operating deficit amounting to $3,279,821. In January, 1932, the deficit was $1,231,186. Operating revenues totaled $76,590,484, a decrease of 19.9 per cent, while operating expenses totaled $67,264,498, a decrease of 19 per cent.

CLASS I RAILROADS
United States, Month of January

	1933	1932	%
Total operating revenues	$226,555,138	$272,115,638	16.7 D.
Total operating expenses	181,679,761	227,032,393	20.0 D.
Taxes	22,059,490	23,955,732	7.9 D.
Net railway operating income	13,265,721	11,182,051	18.6 I.
Operating ratio, per cent	80.19	83.43	.....
Rate of return on property investment, per cent	0.92	0.78	.....

Rate Reduction Petition Opposed by Short Lines

Answer to recent plea of basic commodity shippers filed with commission

The American Short Line Railroad Association has filed with the Interstate Commerce Commission an answer on behalf of its members to the memorial petition recently filed by coal, lumber and agricultural associations asking a general reduction in freight rates on basic commodities. The answer asks the commission to deny the petition although it states that a limited number of members of the association have expressed themselves as being in favor of some reductions, particularly on lumber.

The answer denies that freight rates are at the present time at an unreasonably high level or that the present level of freight rates is a barrier to the revival of trade in basic commodities, saying that the transportation charge has no such sufficient effect upon the price of commodities as to enable a general reduction in freight rates to be of material aid in a recovery from the present economic depression.

"Since the commission could not, as the result of any investigation it might make, order a reduction in freight rates that would stand the scrutiny of the Courts," the statement continues, "so long as present constitutional limitations remain in effect, it would be wholly useless and vain to grant the request of the petitioners for an investigation of the present freight rate structure. To do so would be to impose upon the shippers, the railroads and the public an unnecessary financial burden.

"During the so-called prosperous years the railroads were not permitted to increase freight rates correspondingly with the increase in the level of commodity prices. They should not, therefore, during a period of falling prices of commodities, be required to decrease the freight rates to correspond with such declines in commodity price levels. What the petitioners are really seeking is to have the railroads, through a reduction in freight rates, absorb the difference between the cost of production and the selling price of the commodities in which petitioners are interested.

"The railroads have been continuously reducing rates where necessary in order to meet the competition of other transportation agencies. The petitioners are asking the commission to compel a highly-regulated transportation system to meet the competition of transportation units operating without regulation and under subsidies. Not until the railroads have been put on a fair and equal basis of regulation as compared with their competitors, should they be called upon to consider a reduction in the general level of freight rates.

"A general reduction in freight rates would not attract more business to the railroads, nor contribute to the general welfare of the country. On the other hand, it would result in such a decrease in revenue as to require many of the members of this association to abandon operation of their lines, thus depriving many shippers of the benefits of rail transportation service.

"So long as the operating expenses of the railroads are in a large measure under the control of the regulatory and other governmental agencies, who have permitted but little reductions therein, it is unreasonable to expect, or even ask, these carriers to operate on a lower level of freight rates.

"A condition precedent to any reduction in freight rates is the lessening of the costs of labor, taxes, elimination of grade crossings, and conforming with the many rules, regulations and requirements of regulatory commissions.

"During the years when the railroads have been endeavoring to free themselves of restrictive legislation, and to obtain a reversal of those policies of the government which have resulted in a diversion of the cream of their traffic, taxes have continuously added to their operating costs in order to subsidize competitive transportation agencies. A reversal of this governmental policy is necessarily a condition precedent to any consideration by the railroads of a reduction in freight rates."

Montana Sugar Rates Exempted from Surcharge

The Interstate Commerce Commission has issued a modification of its order requiring the maintenance on intrastate traffic in Montana of rates not lower than the interstate rates plus the surcharge, to except therefrom the intrastate transportation of sugar in carloads.

Equipment Trust Securities Described

Evans Stillman & Company, members of the New York Stock Exchange, have issued the 1933 edition of their handbook entitled "Equipment Trust Securities." Every important outstanding issue of these securities is described, giving the date of issue, interest date, description of equipment covered by the securities, payments to date and other pertinent information. The book contains 354 pages and is attractively bound. It opens with a foreword giving the company's estimate of the character of such issues, which it believes to be of the very best from the standpoint of security.

New Haven Takes Off Unprofitable Trains

Beginning Wednesday, March 8, the third day of the bank holiday, the New York, New Haven & Hartford, discontinued temporarily the Yankee Clipper and the Merchants' Limited, the two fast extra-fare trains between New York and Boston, because of light traffic. Nothing was said as to the duration of the suspension. At the same time 10 other trains were taken off, mostly short runs, between Springfield and New York. Some local trains also have been discontinued to and from Boston. In case of each of the suspensions, there are other schedules, not far away, which will accommodate the traffic.

The New England Transportation Company, controlled by the New Haven, has reduced the number of bus trips between Hartford and Springfield; New York and New Haven and New Haven and Waterbury.

Award of Ocean Mail Contract Is Postponed

Grant of subsidy to steamship line in which three railways are interested held up

As the result of agitation in the Senate in an effort to prevent the award by the Postoffice Department of an ocean mail subsidy contract to the Philadelphia Mail Steamship Company, in which the Baltimore & Ohio, the Pennsylvania, and the Reading are interested, Postmaster General Walter F. Brown on March 2 announced that he had concluded to hold in abeyance, for action by the new Administration, proposals for ocean mail service from Philadelphia, Baltimore, and other Atlantic ports which had been received on March 1.

The proposal of the Philadelphia Mail Line covered service between Philadelphia, Baltimore, and Hampton Roads and Liverpool and Manchester with two ships purchased from the United States Lines and two more to be purchased from the Shipping Board subject to the award of appropriate mail contracts. Bids for the mail contract had been received by the Postoffice Department at noon on March 1, in response to an advertisement issued February 7, about half an hour before the Senate adopted, by a vote of 45 to 28, a resolution proposed by Senator Black, of Alabama, requesting the department to postpone the award until the matter could be more fully investigated by the Senate. Senator Black had attempted for several days to have his resolution passed, contending that the line was to be operated by the International Mercantile Marine, which still has some British-flag ships, and that efforts were being made to rush through a ten-year contract for a million-dollar-a-year subsidy before the change of administrations.

Passage of the resolution was delayed, until after the bids were opened, by filibustering tactics by Senator Reed, Pennsylvania. He pointed out that the plan had been approved by the Interdepartmental Merchant Marine Committee and by the Shipping Board and said that the matter had been under negotiation and investigation for many weeks but that it was desired to have the contract completed before March 4 to avoid the long delay incident to going through the procedure all over again with new officials. He said that the three railroads had furnished the money to make the down payment on the purchases of the ships to provide a service greatly desired by Philadelphia interests.

Postmaster General Brown, in a letter to Senator Black announcing the postponement, said that many Senators had voted for the resolution under a misapprehension, and that the Department had merely proceeded promptly after Congress had provided funds in the independent offices bill for the express purpose of permitting the sale of Shipping Board lines with the award of mail contracts. A strong minority in the Senate had been trying throughout the session to withhold all appropriations for ocean mail contracts already entered into.

Reduced Fares in Pooled Service

The Northern Pacific, the Great Northern and the Union Pacific, operating pooled passenger train service between Seattle, Wash., and Portland, Oregon, will place in effect a two-cents-a-mile one-way rate and a 1½-cent round-trip rate, throughout the line, on March 13.

West Virginia Freight Rates Found Discriminatory

Refusal of the Public Service Commission of West Virginia to permit increases in freight rates for intrastate transportation by the amount of the surcharges applied on interstate rates as the result of the Interstate Commerce Commission's decision in Ex Parte No. 103 last year were found to result in unjust discrimination against interstate commerce in a report issued by the federal commission on March 7. The commission said an order would be entered to require removal of the discrimination by application of the surcharge unless the state commission notifies it by March 15 that it would authorize the increase.

Wage Negotiations

The possibility of further wage reduction negotiations during 1933 is expressed in a statement by Charles Hayden, chairman of the board, and J. E. Gorman, president, of the Chicago, Rock Island & Pacific, in the annual report of that railroad. The statement is as follows: "By agreement between the various labor organizations of the carriers and the company, the 10 per cent reduction in wages agreed on in 1932 has been continued in effect until October 31, 1933. This agreement applies to practically all the Class I roads and affects about 90 per cent of our employees. Negotiations will be in progress during the year for a further reduction in the wages of all organized employees."

R. C. C. Loans

Loans by The Railroad Credit Corporation either actually made or authorized to be made up to February 28 to railroads to meet their fixed interest obligations totaled $61,619,918, according to the monthly report filed with the Interstate Commerce Commission. Of that amount, $49,823,932 represented loans actually outstanding, while $1,236,647 has been repaid, leaving a balance of $10,559,339 to which the corporation is committed. Net proceeds from the emergency rates authorized in Ex Parte 103 by the commission amounted to $61,625,708 for the first twelve months the rates were in effect. The commission, in its decision authorizing the increase, estimated that the emergency rates would yield from $100,000,000 to $125,000,000.

Rates On Meats and Packinghouse Products To Be Revised

A general revision of rates and classification ratings on fresh meats and packinghouse products to, from and between points in southern territory is prescribed by the Interstate Commerce Commission in a report made public March 2, signed by Commissioner Mahaffie, finding justified in some instances and not justified in others schedules filed by the railroads to become effective February 2, 1929, which were suspended and later postponed. Seventh class rating is found reasonable on packinghouse products in carloads, and the commission also proscribes bases for maximum reasonable carload rates on fresh meats and packinghouse products generally in the South and to the South from official, western trunk line and southwestern territories.

Door-to-Door Service in Western Ontario

The Canadian National and Canadian Pacific will provide door-to-door pickup and delivery of freight shipments without extra cost to shipper or consignee at points in Western Ontario between Toronto and Windsor and Sarnia, it has been announced jointly in Montreal by George Stephen, vice-president in charge of traffic of the Canadian Pacific, and Alistair Fraser, acting vice-president in charge of traffic of the Canadian National.

The two railways, the announcement stated, have completed contracts with approximately 45 trucking firms at cities and towns served by their lines in that section, whereby pickup and delivery service will be provided at no extra charge. New tariffs embracing this feature became effective March 6.

The Canadian Roads in January

A decrease of $2,492,430 in the gross revenues of the Canadian National during January, 1933, as compared with the corresponding month of last year, and a reduction in operating expenses for January of $1,659,703 compared with January, 1932, were the features of the monthly report of the system, exclusive of the Eastern Lines. There was a net revenue deficit of $1,420,848, a deficit increase of $832,726 as compared with January of last year.

Gross revenues of $7,675,660, against $9,203,971 in the like month of 1932, are shown in the January statement of the Canadian Pacific. This was a reduction of $1,528,310, but at the same time expenses were reduced by $1,234,203 to $7,352,288, with the result that the company's net revenues for the month were $294,106 lower at $323,372. A year ago, net totaled $617,478.

Further Regulation of Pipe Lines Recommended

Recommendations for some extension of federal regulation of pipe-line transportation are included in a report, submitted to the House on March 2 by the committee on interstate commerce, of a special investigation made by a sub-committee with Dr. W. M. W. Splawn as chief investigator, for consideration at a later session of Congress.

Among the recommendations were that the Interstate Commerce Commission consider its powers under present law to regulate oil pipe line transportation rates in connection with its power to require storage at a reasonable rate with a view to determining what, if any, relief is possible to the small operators who do not own transportation or storage facilities, and that the interstate transportation of gas by pipe lines in interstate commerce be regulated. The report urged that Congress consider whether a certificate of public convenience and necessity should be required as a condition precedent to construction of a gas pipe line and that provision be made to establish a fair rate for gas delivered from a pipe line at the gate of a city, whether to a municipality or to a private corporation. It was stated that in this industry it would be necessary for the regulating authority to have power to reach holding companies but that it appears difficult to apply the "commodities clause" to oil pipe lines because they are plant facilities in an integrated industry.

Low Round-Trip Suburban Fares on New York Central

Reduced-rate one-day round-trip excursion tickets will be available beginning March 15 to patrons of the New York Central for journeys in both directions between New York City and suburban points. The new round-trip rates will average about one and one-half times the one-way fares, some examples being as follows: New York and Yonkers—one way 53 cents, round trip 75 cents; New York and Poughkeepsie—one way $2.63, round trip $3.65; New York and Mt. Vernon—48 cents and 70 cents; New York and Brewster—$1.88 and $2.60. This tariff will be in effect as far as Rhinecliff on the main line; to Pawling on the Harlem division, and Brewster on the Putnam division. These tickets will be sold at New York as well as at the suburban stations.

North Western Exhibit at Century of Progress

By contrasting the "Pioneer", the first locomotive in the West, with one of its Class H locomotives, the Chicago & North Western will present a vivid picture of almost 100 years of development in western railroading in its exhibit in the Travel and Transport building at the Century of Progress Exposition to be opened in Chicago on June 1. The exhibit, which is being built by Marshall Field & Co., will have the "Pioneer" as its focal point. Across the rear of the space, a full size reproduction of a "Class H" locomotive will be shown, with the "Pioneer" in front of the tender. At the south end of the booth, a large map of the railroad and connecting lines will show the territory served by this road.

At the north end of the booth, adjacent to the "Pioneer" locomotive, a table of "firsts" will be listed, in which steps taken by the Chicago & North Western in developing various types of railroad service will be set forth, including the statements that "the North Western was the first to operate trains by telegraph, to construct the first railway mail car, to operate the first sleeping car, to offer the first dining car service and to adopt the 'safety first' slogan."

The flooring of the exhibit will give the effect of railway tracks. There will be a booth in the front part of the exhibit from which to disseminate information to the public. Trains, including the Corn King Limited, the North Western Limited, the Rochester-Minnesota Special, the Col-

umbine, the Overland Limited, the Los Angeles Limited, the Portland Rose and the Victory, will be portrayed in a valance at the front of the exhibit.

Ask Conciliation Board in Canada

The two principal railways of Canada—Canadian National and Canadian Pacific—have made application to the Minister of Labor at Ottawa for establishment of a board of conciliation to deal with a wage dispute with its employees. The application comes as a result of a notification which was given by these companies to their locomotive men, trainmen and telegraphers of a proposed reduction of wages effective March 3, to which reduction the unions' representatives refused to assent.

The proposed wage reduction is at the rate of 20 per cent below the basic rates of pay, specified in agreements with these classes, which were in effect prior to December 31, 1931. This would mean, in actuality, another 10 per cent, in addition to the 10 per cent deduction which has been in effect during the past year.

The application was signed by S. J. Hungerford, acting president of the Canadian National, and Grant Hall, vice-president of the Canadian Pacific. The application refers to conferences which were held between representatives of the railways and employees concerned, and the statement is made that all efforts to obtain a satisfactory settlement have failed.

The Canadian Industrial Disputes Act provides in such a case for the appointment of a conciliation board composed of three, one representing the employees, another the companies, and the third would be chairman.

Congress Called in Special Session

Although President Roosevelt acted promptly to call the Seventy-Third Congress into special session beginning on March 9 to deal with the banking crisis, it is understood that consideration of the legislation proposed to make the "new deal" applicable to the problems of transportation will have to wait until the emergency financial legislation and perhaps one or two other subjects are disposed of, and that a recess of two or three weeks may be taken before Congress is called on to consider a program of general legislation.

All bills introduced during the Seventy-second Congress and not acted upon expired with the adjournment on March 4, but many will be reintroduced and some new ones are expected. Chairman Rayburn, of the House committee on interstate and foreign commerce, is hoping to bring about passage of his Section 15a and holding company bills, which were reported by the committee last year, without further hearings. He also hopes to pass some kind of a bill for the regulation of highway transportation, which would probably require hearings.

Representative Rayburn, being a Democrat, will remain as chairman of the House committee in the new Congress, but Senator Couzens' chairmanship of the Senate committee on interstate commerce, which he has used principally to block legislation for the regulation of motor transportation, expired on March 4. It now appears that his Democratic successor will be Senator C. C. Dill, of Washington. Senator Smith, of South Carolina, who was chairman of the committee the last time the Democrats had a majority in the Senate and who was still its ranking Democratic member, preferred to become chairman of the committee on agriculture, and Senator Pittman, of Nevada, who was next in line, was chosen president pro tem. of the Senate, which left Senator Dill as the ranking member.

Great interest is being displayed in the orders that President Roosevelt is expected to issue under his new authority to reorganize government agencies, as they may affect the Interstate Commerce Commission. It has been understood for some time that he was planning to reorganize the commission with a view to concentrating in it such regulation of all forms of transportation as may be eventually provided for by new legislation, and it has been understood that Walker D. Hines, former director general of railroads, has been working on details of the plan. Rumors have also been current that the plan also contemplated making the commission in some form a part of the Department of Commerce instead of an independent body.

The independent offices appropriation bill, which includes the appropriation of $7,137,639 for the Interstate Commerce Commission for the fiscal year 1934 and which also includes the appropriations for most of the independent organizations which would be most affected by a reorganization plan, was not signed by President Hoover on March 4, although it had been passed by both houses of Congress, and therefore remains for reconsideration by the new Congress. President Hoover explained his refusal to sign the bill in a statement protesting because Congress had exceeded his budget recommendations in passing the appropriation bills generally, of which this is one of the largest, but it has been suggested that there may have been also the further design of holding up these appropriations until the reorganization plan is perfected.

Work Loan to C. P. R. Questioned

A lively debate developed in the House of Commons at Ottawa last week when the government introduced a bill asking for the extension for another year of its extraordinary powers to deal with the unemployment problem. The only difference in this year's legislation is that so far as direct relief is concerned a limit of $20,000,000 is imposed on the amount that may be paid out of the federal treasury.

Trouble arose during the debate when Liberals raised the question as to the money loaned by the government to enable the Canadian Pacific to reopen its shops last year. The amount was approxmately $1,500,000 and no interest was to be charged, the condition imposed by the government being that no dividend was to be paid by the company on the common stock until the loan was repaid. The Liberal leader, Rt. Hon. W. L. Mackenzie King, took exception to advances to private corporations out of the public treasury, while Premier R. B. Bennett declared that the money did not really go to the railway company but rather to provide work.

Hon. Robert J. Manion, Minister of Railways, later in the discussion stated that it did not make much difference what form the help took. If the advance had not been made to the C. P. R. about as much public money would have been spent in relief to the unemployed of that road. Premier Bennett resented the the suggestion that more sympathy was being shown to private corporations than to individuals.

Equipment and Supplies

PASSENGER CARS

THE MISSOURI-KANSAS-TEXAS has ordered four lounge cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of February 25.

IRON AND STEEL

THE ERIE is expected to enter the market for 30,000 tons of rails.

THE MISSOURI PACIFIC is inquiring for 125 tons of structural steel for bridge repair work at St. Louis, Mo.

SIGNALING

DELAWARE, LACKAWANNA & WESTERN.—This company has petitioned the Interstate Commerce Commission for authority to substitute automatic cab signals for the automatic train control required by the commission's orders on its line between East Buffalo, N. Y., and Scranton, Pa.

Construction

MONTOUR.—Contracts for grading in connection with the construction of this company's 13-mile line between Negley, Ohio, and Smith's Ferry, Pa., have been awarded to the following companies: Riley & Quinn, Youngstown, Ohio, 72,000 cu. yd.; the Hine-McKinley Company, Pittsburgh, Pa., 90,000 cu. yd.; and James S. Rinehart, Liverpool, Ohio, 35,000 cu. yd. A contract for the construction of a 1000-ft. single-track tunnel near Smith's Ferry has been awarded to the Booth & Flinn Company, Pittsburgh, Pa.

NEW YORK CENTRAL.—This company has given a contract to the Raisler Sprinkler Company for installing an automatic dry pipe sprinkler system in the new St. John's Park freight terminal, now under construction between West and Washington streets from Clarkson to Charlton streets, New York City. A contract has also been given to the Walsh Construction Company, Syracuse, N. Y., for grading work, culverts, etc., in connection with the first ward branch connection on Syracuse junction branch, Hiawatha Boulevard, two miles north of Syracuse station.

Supply Trade

At a special meeting on March 7, of the board of directors of the **Columbia Nut & Bolt Company, Inc.**, Bridgeport, Conn., **Howard P. Cook** was elected president and treasurer, and **J. L. Atwater**, vice-president and secretary.

Lucien Q. Moffitt, Inc., People's Bank building, Akron, Ohio, has been appointed exclusive distributor by the **B. F. Goodrich Rubber Company,** Akron, for its cutless rubber bearings in the United States and Canada. **Lucien Q. Moffitt,** who has been manager of the cutless rubber bearing department of the Goodrich Rubber Company since this new bearing was placed on the market several years ago, heads the new distributor company. With him are associated the same engineering and sales personnel which handled these bearings in the Goodrich office.

H. B. Crantford, in charge of railroad sales for the Electric Storage Battery Company, Philadelphia, Pa., has resigned to go with **Thomas A. Edison, Incorporated,** Edison Storage Battery division. Mr. Crantford will act as special railroad representative of the division, with headquarters at the general offices of the company, West Orange, N. J. Mr. Crantford, prior to 1919, was employed in various railroad services, resigning from the Chicago, Milwaukee, St. Paul & Pacific in 1919 to go to the Electric Storage Battery Company as salesman in the Chicago territory. He was, successively, manager of railway signal sales, assistant manager of the railway division and since August, 1931, in charge of the railway division of that company.

C. Marshall Taylor has been appointed manager of the new products division of the **G. M. Basford Company**, New York advertising agency. For the last six years, Mr. Taylor was vice-president and general manager of Curtin-Howe Corporation, timber preservation engineers. Among his connections before that were the Sharples Solvents, the Reading Company, the International Creosoting Construction Company and the Charles E. Hires Company. The G. M. Basford Company since the inception of its new products division has done pioneering work in getting industrial advertisers to appreciate the value of adding new articles to their lines, particularly under present economic conditions.

C. Marshall Taylor

Colorado Fuel & Iron Company

The annual report of the Colorado Fuel & Iron Company for 1932 shows a loss of $4,253,261, as compared with a loss of $3,363,206 in 1931. The company had an "operating gain" for the year of $1,544,071, which, however, was converted into a "net loss surplus" because of items aggregating $5,797,332 and including a non-operating loss of $240,872, depreciation of $1,314,075, bond interest of $1,609,162, inventory adjustments of $662,121, general taxes of $733,094, additional reserves for bad and doubtful accounts of $271,092, service retirements of $181,193, group insurance of $52,396 and repairs and maintenance of $670,254. Current assets totaled $8,453,112 and current liabilities $2,300,154. The comparative consolidated income account for the years ending December 31, 1932 and 1931 are as follows:

	1932	1931
Total deficit after deducting operating expenses (including ordinary repairs and maintenance and general taxes) and selling, administrative and general expenses	$1,495,661*	$576,044*
Interest and other miscellaneous income	252,917	339,587
	$1,242,744*	$236,457*
Interest on bonds and notes	1,611,369	1,626,530
	$2,854,113*	$1,862,987*
Provision for depreciation of plants and exhaustion of minerals	1,387,148	1,473,721
	$4,241,261*	$3,336,708*
Federal income taxes of prior years	12,000	26,498
Net loss for year	$4,253,261*	$3,363,206*

*Loss.

OBITUARY

William A. Rossell, assistant northeastern district manager of the Westinghouse Electric & Manufacturing Company, at New York, died suddenly on March 8 at his home in Summit, N. J.

Darr W. Anderson, superintendent of the French plant at Latrobe, Pa., of the Railway Steel Spring Company, died on February 28 in the Latrobe Hospital. He was born 65 years ago at Fredericksburg, Ohio, and had been in the service of manufacturers of springs for 42 years having commenced with the A. W. French Company, Pittsburgh, in 1890. After the absorption of that company by the Railway Steel Spring Company, Mr. Anderson was transferred to the latter company's Oswego, N. Y., plant as superintendent. He then served for three years in Philadelphia, Pa., returning to Pittsburgh in 1912 as superintendent of the French plant. In 1924, he supervised the removal of the plant to Latrobe.

Frank LaBaron M. Talbot, head of the contracting firm of F. M. Talbot Company, New York, died of pneumonia on March 6 in the Mountainside Hospital, Glen Ridge, N. J. Mr. Talbot was born 71 years ago at Lubec, Me. After serving with Arthur McMullin & Company and later as president of Flikwir & Busch, railroad contractors, he organized, about 20 years ago, the above-named firm. The railway construction work for which this company received contracts included building a section of the Tunkhannock viaduct, the Martins Creek viaduct and track elevation through Orange, N. J., and vicinity on the Delaware, Lackawanna & Western and the Delaware river bridge at Yardley, Pa., of the Reading Company.

Financial

CHICAGO & NORTH WESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $6,555,000 of general mortgage bonds of 1887 to be held in its treasury.

CHICAGO & NORTH WESTERN.—*Bonds.*—The Interstate Commerce Commission has authorized the Chicago, St. Paul, Minneapolis & Omaha to issue $45,186,000 of first mortgage 5 per cent bonds, series A, to be sold to the Chicago & North Western at par and the proceeds used to cancel an indebtedness of that amount to the latter company which, in turn, is authorized to assume liability for these bonds and to pledge them as collateral security for notes.

CHICAGO & NORTH WESTERN.—*Debentures.* To meet the maturity, on May 1, of $6,355,000 of its 5 per cent sinking fund debentures this company asks holders to accept 50 per cent in cash and 50 per cent in 5 per cent general mortgage bonds. The funds for the cash payment are to be made available by the Reconstruction Finance Corporation provided holders agree to the plan. Holders who present their debentures for stamping under the plan before March 31 will receive 10 per cent in cash as an advance payment.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a branch extending from Coburn, Nebr., to Wynot, 45.4 miles.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Abandonment.*—The Interstate Commerce Commission has denied without prejudice the application of this company to abandon a line extending from Madelia, Minn., to Fairmont, 28.4 miles. In its report on this application the commission said: "In connection with the acknowledged effect of highway competition on the branch line traffic, the interveners developed the fact of a growing sentiment in southern Minnesota against truck patronage. There is also testimony to the effect that legislation to restrain unfair truck competition probably will be enacted by the state legislature at its next session." Under such circumstances the Commission believed that the line should be kept in operation for another year to "afford the people of the territory ample opportunity to demonstrate what support of the branch may be expected in the future."

ERIE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to extend from March 1, 1933, to

March 1, 1938, the date of maturity of $4,616,000 of New York & Erie 3rd mortgage extended 4½ per cent bonds. Drexel & Company of Philadelphia have arranged to underwrite the extension at a commission of 6 per cent, from which commission the underwriters will pay to the holder of each $1000 bond, $53.66, leaving a net commission of 1.634 per cent and making the annual cost to the railroad 5.902 per cent.

GALVESTON, HOUSTON & HENDERSON.—*R. F. C. Loan.*—Division 4 of the Interstate Commerce Commission has approved a loan of $1,061,000 to this company from the Reconstruction Finance Corporation to pay at maturity on April 1 one-half the principal of its first mortgage 5 per cent bonds now outstanding.

ILLINOIS CENTRAL.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $1,500,000 of western lines first mortgage 4 per cent bonds to be pledged with the Railroad Credit Corporation as collateral security for a loan of $1,000,000.

MISSOURI PACIFIC.—*Notes.*—The Interstate Commerce Commission has authorized the International-Great Northern to issue $864,310 of promissory notes to be delivered to the Missouri Pacific in satisfaction of indebtedness.

MISSOURI PACIFIC.—*N. O., T. & M. Notes.*—The Interstate Commerce Commission has authorized the New Orleans, Texas & Mexico to issue $7,456,726 of promissory notes to be delivered to the Missouri Pacific in payment of advances.

MONONGAHELA.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire control by purchase of the Monongahela & Ohio River, the Scotts Run, and the Indiana Creek & Northern, which it now controls by stock ownership and which it operates.

NEW YORK CENTRAL.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and the Michigan Central to abandon the Barron Lake branch extending from Howard township to Niles township, Mich., 5.4 miles.

NEW YORK CENTRAL.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $7,000,000 to pay that amount of Boston & Albany improvement bonds of 1908 due May 1. The Boston & Albany has also applied to the Interstate Commerce Commission for authority to issue $7,000,000 of refunding 6 per cent bonds, to be guaranteed by the New York Central and to be pledged as collateral for the loan.

NEW YORK, CHICAGO & ST. LOUIS.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $3,041,000 of refunding mortgage 4½ per cent series C bonds to reimburse its treasury for capital expenditures, the bonds to be pledged and repledged as collateral security for loans from the Railroad Credit Corporation.

ST. LOUIS & TROY.—*Acquisition and Operation.*—The Interstate Commerce Commission has authorized this company to acquire and operate a 5.2-mile line extending from Troy, Mo., to Moscow, this line being a segment of the St. Louis & Hannibal, the abandonment of which has been authorized. The Chicago, Burlington & Quincy has been authorized to construct a connection with the St. Louis & Troy at a point near Moscow. The new company is also authorized to issue a promissory note for $30,000 and 200 shares of capital stock without par value, the note and 100 shares to be issued in payment for the line which is acquired, and the remaining shares to be sold at not less than $100 each and the proceeds used for rehabilitation and purchase of equipment.

ST. LOUIS-SAN FRANCISCO.—*R. F. C. Loan.*—The receivers have informed the Interstate Commerce Commission that they have been advised by their counsel that they cannot legally comply with the condition attached by the commission to its recent order approving a loan of $3,000,000 to the receivers from the Reconstruction Finance Corporation that the receiver should secure by receivers' certificates loans made to the railway company by the corporation prior to the appointment of the receivers. They have requested the commission to reconsider its action and grant approval of the loan application as requested.

SOUTHERN PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has authorized Morgan's Louisiana & Texas and the Texas & New Orleans to abandon a connection between their Napoleonville, La., branch and the LaFourche branch of the Texas & Pacific, 1.2 miles; and the abandonment by the T. & N. O. of operation under trackage rights over the T. & P. to two sugar refineries, 1.1 miles.

Abandonment.—The Commission has authorized the Houston & Texas Central and the Texas & New Orleans to abandon a branch extending from Nelleva Junction, Tex., to Mexia Junction, 94.1 miles.

SOUTHERN PACIFIC.—*Preliminary Report.*—The preliminary report of the Southern Pacific Lines shows net deficit after interest and other charges of $5,779,631, a net difference of $12,918,033 less than last year's total of net income. Selected items from the Income Statement follow:

	1932	Increase or Decrease
Railway operating revenues	$142,597,140	—$56,045,035
Maintenance of way	16,916,666	—7,744,528
Maintenance of equipment	26,470,616	—7,708,986
Transportation	54,688,881	—18,380,717
Total operating expenses	115,202,961	—36,505,587
Net revenue from operations	27,394,179	—19,539,448
Railway tax accruals	14,768,413	—2,288,422
Equipment and joint facility rents—net	6,963,650	—887,340
Net railway operating income	5,606,157	—16,358,298
Non-operating income	20,635,954	+3,346,548
Gross income	26,239,760	—13,036,977
Rent for leased roads and misc. rents	850,779	—25,992
Interest on funded debt	29,708,351	—188,085
Total deductions from gross income	32,019,391	—118,974
Net deficit	5,779,631	+12,918,003

VICKSBURG BRIDGE & TERMINAL.—*Proposed Operation.*—This company which owns a combination highway and railway bridge across the Mississippi river at Vicksburg, Miss., has been denied permission by the Interstate Commerce Commission to operate a railroad between Vicksburg, Miss., and Delta, La.

WACO, BEAUMONT, TRINITY & SABINE.—*R. F. C. Loan.*—The receiver has applied to the Reconstruction Finance Corporation for a loan of $200,000 to pay short term notes, vouchers, taxes, wages, etc. He had originally applied for a loan of $8,983,000 which was not approved by the Interstate Commerce Commission.

WESTERN PACIFIC.—*Bonds.*—The Interstate Commerce Commission has modified a previous order, which authorized this company to issue $4,000,000 of general and refunding mortgage bonds, series B, so as to authorize the pledge of $2,000,000 of these bonds and the company's equity in the remainder as collateral security for notes issued to the Railroad Credit Corporation.

Dividends Declared

Alabama & Vicksburg.—Capital, 3 per cent, semi-annually, payable April 1 to holders of record March 8.

Vicksburg, Shreveport & Pacific.—Preferred, 2½ per cent, semi-annually; common, 2½ per cent, semi-annually, both payable April 1 to holders of record March 8.

Railway Officers

EXECUTIVE

S. D. Wheeler, vice-president in charge of the accounting department of the Litchfield & Madison, has had his headquarters moved from St. Louis, Mo., to Edwardsville, Ill.

G. W. Webster, vice-president of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., has been elected also secretary succeeding **C. S. Pope,** resigned.

The jurisdiction of **Charles E. Smith,** vice-president in charge of purchasing of the New York, New Haven & Hartford and associated companies, has been extended to include also the supervision of operations of the New England Transportation Company and the County Transportation Company, highway subsidiaries of the New Haven.

Carl S. Klumpp, who has been appointed president and general manager of the Hudson & Manhattan, was born at Union City, Ind., in 1884. After attending high school Mr. Klumpp studied engineering and later commenced his railroad career in the maintenance of way department of the New York Central. He also served in the maintenance of way departments of the Chicago, St. Paul, Minneapolis & Omaha, the Buffalo, Rochester & Pittsburgh, and the Brooklyn-Manhattan Transit Lines. In 1907, he became associated with the Hudson & Manhattan, serving in the track and signal construction department. From 1909 to date he has served successively as assis-

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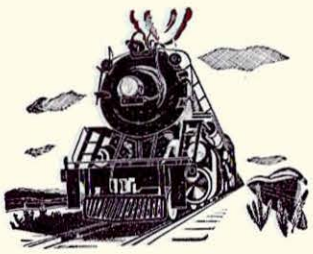

OLD LOCOMOTIVES *handicap* PROFITABLE OPERATION

"In the six years from 1927 to 1932, inclusive, installation of new locomotives on Class 1 roads amounted to less than 2,900 units. This is a renewal rate of about 1% on the total of 52,000 locomotives owned by railroads, and if continued it would take 100 years for the carriers to replace their locomotive equipment with modern power.

The inadequacy of such a renewal policy can be visualized when it is realized that modern locomotives show operating economies ranging from 20% to 35% in actual comparative results with engines only 10 years old. Yet 83% of the locomotives on Class 1 roads today are more than 10 years old and nearly 53% are more than 20 years old."

— Wall Street Journal, February 24, 1933

NEW POWER IS SORELY NEEDED TO IMPROVE RAILROAD EARNINGS

LIMA LOCOMOTIVE WORKS, INCORPORATED
LIMA OHIO

tant to general superintendent, superintendent of way and structures, superintendent of operation, general superintendent and for the past several years as general manager.

Frank L. Burckhalter, general manager of the Southern Pacific, Pacific Lines, has been elected vice-president of the Southern Pacific Company, with headquarters as before at San Francisco, Cal. In his new position, which is a newly-created one, Mr. Burckhalter will have such duties and responsibilities as may be assigned to him from time to time by the president of the company. Mr. Burckhalter was born at Truckee, Cal., in 1879, and graduated from the University of California in 1900. Shortly thereafter he entered railway service as a rodman in the engineering department of the Southern Pacific and later served until February, 1902, as a levelman and computor on location survey parties,

F. L. Burckhalter

then being appointed successively assistant engineer, construction foreman and roadmaster. From March, 1906, to November, 1911, he served as division engineer at Bakersfield, Cal., and at Los Angeles, then being promoted to district engineer at Portland, Ore. On March 1, 1914, Mr. Burckhalter was transferred to the operating department as superintendent of the Portland division, with headquarters at Portland, Ore. He was promoted to assistant general manager, with headquarters at San Francisco, on September 1, 1918, being further promoted to first assistant general manager with the same headquarters, on June 1, 1925. On January 1, 1929, Mr. Burckhalter was advanced to general manager of the Pacific Lines of the Southern Pacific, which position he continued to hold until his recent election as vice-president.

Lynne L. White, assistant to the president of the Erie, with headquarters at Cleveland, Ohio, has been elected also to the newly-created position of vice-president. Mr. White was born on July 2, 1889, at Kenwood Park, Iowa, and obtained his first railroad experience at the age of 15 years as a file clerk in the passenger department of the Chicago, Rock Island & Pacific, at Cedar Rapids, Iowa. After attending a business college for a time during 1905 and 1906 he returned to the Rock Island in April, 1906, as a stenographer and clerk in the office of the division passenger agent at Cedar Rapids. From 1907 to 1918, Mr. White served as a stenographer, clerk, timekeeper, secretary and chief clerk and chief dispatcher at

Lynne L. White

various points on the Rock Island. For a short time he also served as a stenographer and trainmaster's clerk on the St. Louis-San Francisco at Enid, Okla. In February, 1918, he became chief clerk to the general superintendent of the Erie at Chicago, and then served successively on this road as chief clerk to the general agent at Chicago, chief clerk to the general manager at Chicago and trainmaster at Hammond, Ind. In June, 1922, Mr. White was promoted to superintendent of the Chicago division, and in April, 1928, he was transferred to the Marion division at Huntington, Ind., being promoted to assistant general manager of the Western district with headquarters at Youngstown, Ohio, in June, 1929. He was further advanced to assistant to the president on September 16, 1929, which position he continues to hold together with that of vice-president.

FINANCIAL, LEGAL AND ACCOUNTING

Edmund T. Lukens, real estate and tax agent of the Delaware, Lackawanna & Western, retired from active service on March 1. Mr. Lukens will continue for the present with the real estate department in an advisory capacity, with the title real estate and tax agent, retired.

H. D. Heuer, assistant secretary of the Terminal Railroad Association of St. Louis, has been promoted to secretary and auditor, to succeed **C. A. Vinnedge,** who has retired. **E. J. Coady,** assistant to the auditor, has been appointed treasurer, paymaster and assistant secretary and his former position has been abolished. **V. F. Steinberg,** treasurer, has been appointed assistant paymaster.

W. Newcome, general attorney of the Chicago, St. Paul, Minneapolis & Omaha and assistant Minnesota attorney for the Chicago & North Western, with headquarters at St. Paul, Minn., has been appointed Minnesota attorney for the North Western, in addition to his duties as general attorney for the Omaha. Mr. Newcome succeeds **W. T. Faricy,** whose appointment as general solicitor of the Chicago & North Western System was noted in the *Railway Age* of March 4.

W. H. Wilson, comptroller of the Norfolk & Western, retired from active service on February 28, and **J. C. Cooke,** general auditor has been appointed the succeed Mr. Wilson as comptroller. **W. A. Gibbons,** auditor of freight receipts, has been appointed auditor of revenues, and **R. F. Moore,** auditor of passenger receipts, has been appointed assistant to auditor of revenues. These officers will have headquarters at Roanoke, Va., as before.

Mr. Wilson was born in Philadelphia, Pa., on February 1, 1863, and received his education in the public schools of that city and at Pierce Business College. He began his business career as a bookkeeper for a private concern at that point. He entered the service of the Norfolk & Western as a clerk on June 20, 1883, and in April,

W. H. Wilson

1902, he was appointed to chief clerk to comptroller. Five years later he was advanced to auditor of disbursements. Mr. Wilson served in that capacity until March, 1920, when he was promoted to assistant comptroller. On January 1, 1924, he was

J. C. Cooke

appointed comptroller, the position he held until his retirement.

Mr. Cooke was born on November 24, 1867, in Gloucester County, Va., and was educated at Gloucester Academy. He began his railroad career as a clerk in the office of the superintendent of car service

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FRANKLIN RAILWAY SUPPLY COMPANY, INC., NEW YORK, CHICAGO, MONTREAL

of the Philadelphia & Reading in November, 1888. On June 24, 1890, he entered the service of the N. & W. at Roanoke, Va., as a clerk. Nine years later he was promoted to assistant clerk in charge of the waybill bureau. In April, 1907, he was

W. A. Gibbons

again promoted, this time as clerk in charge of the waybill bureau. Mr. Cooke was made chief clerk to the auditor of receipts on January 12, 1911. He was advanced to auditor of freight receipts on May 1, 1924, and general auditor on July 1, 1930, the position he held at the time of his recent promotion.

Mr. Gibbons was born on October 16, 1868, in Rockingham County, Va. He was educated at Oak Hill Academy in Rockingham County and Randolph-Macon College, Ashland, Va. He entered the service of the Norfolk & Western on April 23, 1888, as clerk in the office of the auditor at Roanoke, Va. In July 1890, he was promoted to clerk in charge of the station accounts bureau, which position he held until May 1, 1924, when he was advanced to auditor of station accounts. On July 1, 1930, he was appointed auditor of freight receipts, the position he held until his recent appointment.

OPERATING

A. A. Freiberger, assistant superintendent on the Chicago Great Western, with headquarters at Stockton, Ill., has been promoted to superintendent of the Illinois-Iowa division, with headquarters at Oelwein, Iowa, to succeed **S. V. Rowland,** who has retired.

E. C. Manson, superintendent of the Idaho division of the Oregon Short Line, with headquarters at Pocatello, Idaho, has had his jurisdiction extended to include the Utah division, and now has jurisdiction over all the lines of this company. **R. A. Pierce,** superintendent of the Utah division, with headquarters also at Pocatello, has been appointed to the newly-created position of assistant superintendent with the same headquarters.

Armand T. Mercier, vice-president and general manager of the Pacific Electric (a subsidiary of the Southern Pacific), with headquarters at Los Angeles, Cal., has been appointed general manager of the Southern Pacific, Pacific Lines, with headquarters at San Francisco Cal., succeeding **Frank L. Burckhalter,** who has been elected vice-president of the Southern Pacific Company. Mr. Mercier has been connected with the Southern Pacific and its subsidiaries, the San Diego & Arizona and the Pacific Electric, for 29 years. He was born on December 11, 1881, at New Orleans, La., and graduated from Rugby Academy and Tulane University, completing a course in civil engineering at the latter school in 1903. He entered railway service in January, 1904, as a transitman and clerk to a roadmaster on the Southern Pacific at Los Angeles. During the following 13 years Mr. Mercier was advanced successively through the positions of assistant gang foreman at Los Angeles, assistant engineer in charge of reconstruction work on the Colorado river, general foreman and engineer of bridges and buildings in charge of steel bridge construction, engineer and general foreman in charge of terminal construction work at San Pedro,

Armand T. Mercier

Cal., and Los Angeles, assistant division engineer of the Los Angeles division, assistant district engineer of the Southern district, and division engineer of the San Joaquin and the Los Angeles divisions. In February, 1917, he was appointed assistant superintendent of the Shasta division at Dunsmuir, Cal., then being promoted to superintendent of the Portland division at Portland, Ore., in September, 1918. In November, 1921, he became general manager of the San Diego & Arizona, with headquarters at San Diego, Cal., and in April, 1927, he was elected also president of that road. On July 3, 1929, he was elected vice-president and general manager of the Pacific Electric, which position he continued to hold until his recent appointment.

ENGINEERING AND SIGNALING

M. H. Doughty, who has been appointed engineer of maintenance of way, of the Delaware, Lackawanna & Western, with headquarters at Hoboken, N. J., was born on September 3, 1877, at Maxville Prairie, Wis., and received his higher education in the State College of South Dakota, from which he was graduated in 1900, with the degree of B.S. in Engineering. During 1901 and the early part of 1902, he continued his studies in civil engineering at the University of Minnesota, and then, on March 1 of the latter year, he accepted a position on the Lackawanna

M. H. Doughty

as a transit man in the engineering department. From 1902 to 1909, Mr. Doughty held various positions in the engineering department, and in 1910 he was appointed assistant to the chief engineer. In 1912 he was appointed general manager of the Moore Timber Company, Panama City, Fla., a company owned and operated by the Lackawanna, and in 1914 returned to the parent company to become again assistant to the chief engineer, in charge of valuation and other matters as assigned. In 1917 he was appointed division engineer at Hoboken, the position he was holding at the time of his recent promotion to engineer of maintenance of way.

Daniel Hillman, who has been appointed district engineer of the Canadian Pacific, with headquarters at Montreal, Que., was born at Bothwell, Ont., on November 6, 1877. Mr. Hillman entered railroad service in October, 1901, with the C. P. R., and served successively as chainman, rodman, topographer, levelman and transitman. From 1905 to 1912 Mr. Hill-

Daniel Hillman

man served as assistant engineer. In 1913, he was appointed division engineer, survey and construction in eastern Canada. After military service in the World War from

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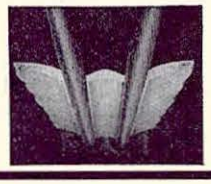


AMERICAN ARCH CO.
INCORPORATED
Locomotive Combustion Specialists » » »

1915 to 1919 Mr. Hillman returned in December, 1919, to the C. P. R. as district engineer of construction and in 1923 he became engineer of construction, the position he held until his recent appointment as district engineer, Quebec district.

M. H. Brown, Jr., division engineer of the Idaho division of the Oregon Short Line, with headquarters at Pocatello, Idaho, has had his jurisdiction extended to include the Utah division, and now has supervision over all the lines of this company. The position of division engineer of the Utah division, which has been held by **E. E. Moberly**, with headquarters also at Pocatello, has been abolished.

OBITUARY

C. I. Luque, general superintendent of transportation, Mexican Railway, Mexico City, died March 8 after a long illness.

N. H. Young, who retired on January 1, 1929, as superintendent of the St. Louis (Mo.) terminal of the Chicago, Burlington & Quincy, died at St. Louis, on March 1.

William H. Malcolm, office assistant to the publicity manager, New York Central Lines, died of pneumonia at his home in Mt. Vernon, N. Y., on March 3. He was born at White Plains, N. Y., on March 26, 1897, and had been with the New York Central since December 1, 1913, except for a period of seven month' military service during the World War. After working in several departments of the railroad he was appointed chief clerk in the publicity bureau, June 1, 1919, and in 1928 he was made office assistant.

Homer A. Empie, purchasing agent of the Delaware & Hudson, with headquarters at Albany, N. Y., died on February 20. Mr. Empie was born on May 1, 1877, at Breakabeen, N. Y. He entered railroad service on November 1, 1899, with the Delaware & Hudson, as agent and telegrapher. Between the years of 1905 and 1908 he served as agent at Delanson, Cobleskill, and Oneonta, N. Y. On January 11, 1912, he was appointed division agent of the Saratoga and Champlain divisions, and in 1914, he was transferred to a similar position on the Susquehanna division. On February 1, 1916, he was appointed assistant trainmaster of the same division, and in October of that year was transferred in the same capacity to the Saratoga division. Between the years 1916 and 1917 he held the positions of chief of bureau of car utilization, chief clerk to general manager, and general fuel agent, with headquarters at Albany, N. Y. On October 1, 1928, he was appointed superintendent of the Champlain division, and in February, 1930, he was appointed purchasing agent, the position held until his death.

Henry W. Forward, consulting traffic officer of the Erie at Chicago, who retired from active service in 1931 as freight traffic manager of the lines of the Erie west of Buffalo, N. Y. and Salamanca, died on March 4 in St. Luke's Hospital, Chicago, of pneumonia. Mr. Forward was born at Somerset, Pa., on August 8, 1859, and entered railway service at the age of 16 as an office boy on the Atlantic & Great Western (now part of the Erie), later serving as chief clerk in the general freight office of the New York, Pennsylvania &

Henry W. Forward

Ohio (now also part of the Erie) at Cleveland, Ohio, and as division freight agent on the Chicago & Erie at Chicago. He was promoted to assistant general freight agent of the Erie at Chicago in 1896, and in 1908 he was further promoted to general freight agent. In 1927 he was appointed assistant freight traffic manager at Chicago, and in the following year he became freight traffic manager, which position he was holding at the time of his appointment as consulting traffic officer in 1931.

Harry T. Bentley, who retired as general superintendent of motive power of the Chicago & North Western on September 1, 1927, died of pneumonia on March 1 at his home in Oak Park, Ill., a suburb of Chicago. Mr. Bentley was born in London, England, on June 4, 1862, and attended Dulwich College. He entered railway service at the age of 15 as a machinist apprentice on the London & North Western (now part of the London, Midland & Scottish), and in 1887 he was promoted to foreman of the enginehouse at Chester, England. In 1892, Mr. Bentley

Harry T. Bentley

came to the United States and entered the service of the Chicago & North Western as a machinist in the Chicago shops. Soon he was promoted to foreman in the shops at Boone, Iowa, being transferred to Belle Plaine, Iowa, in 1895. In 1898, he was advanced to general foreman in the shops at Clinton, Iowa, being later in the same year appointed master mechanic of the Madison division. He was transferred to the Iowa division on December 30, 1899, where he remained until August 31, 1902, when he was promoted to assistant superintendent of motive power and machinery, with headquarters at Chicago. On October 31, 1913, Mr. Bentley was advanced to superintendent of motive power and machinery at Chicago, becoming general superintendent of motive power and machinery on May 1, 1922. During the war Mr. Bentley served as assistant director of transportation of the United States Railroad Administration, in charge of mechanical matters. Mr. Bentley was a past president of the American Railway Master Mechanics' Association, of the International Railway Fuel Association, and of the Western Railway Club. He was chairman of the committee on Locomotive Design and Construction, Mechanical division, American Railway Association, from 1923 to 1927.

Louis C. Winship, electrical engineer of the Boston & Maine, with headquarters at North Billerica, Mass., died of heart disease in Cambridge, Mass., on March 2.

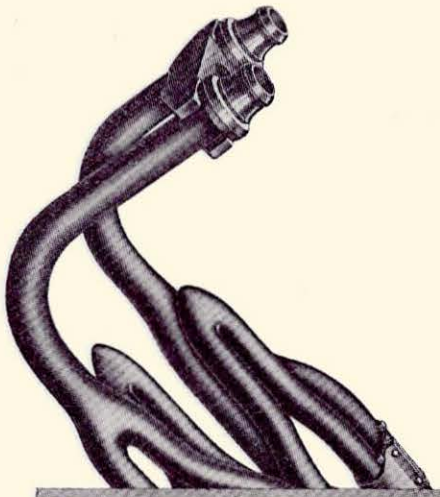
Louis C. Winship

He was educated at Hamline University, St. Paul, Minn., (PH.B. 1902) and Massachusetts Institute of Technology, Boston, Mass. (S.B. 1905). During 1905-06 Mr. Winship was engaged as engineering apprentice at Westinghouse Electric & Manufacturing Company, serving part of this time in the railway engineering division. Mr. Winship entered railroad service in 1907, engaging in electric locomotive testing with the Pennsylvania, and in installation of electrical operation, New York, New Haven & Hartford, for the Westinghouse Electric & Manufacturing Company. From 1909 to 1910, he was engaged in operation of electrical zone, New York, New Haven & Hartford, and in 1911, he became electrical superintendent in charge of electrical operation of Hoosac tunnel with the Boston & Maine. From 1914 to 1927 he was supervisor power plants, and in 1927 he was appointed electrical engineer, the position he held until his death.

Tables of Revenues and Expenses of Railways begin on next left-hand page

SUPERHEATERS WORK HARDER

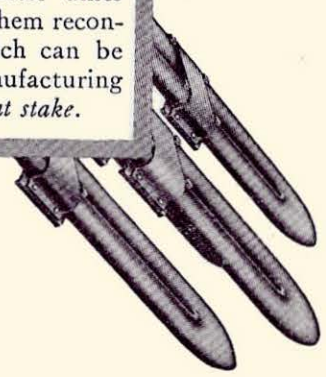
They Need More Attention



MOTIVE power men, who are so accustomed to having superheater units give years of service, with little attention, overlook the effect of the steadily increasing severity of operating conditions on the superheater units, and the need for renewal of equipment.

Twenty years ago superheater units were subjected to less severe conditions, compared with present operating conditions. Then, for example, fireboxes ran from 8 to 12 years before requiring renewal, and the superheater units generally outlived the fireboxes. Today locomotives equipped with stokers, handling longer trains, running up mileage in much shorter time, require firebox renewals in half that time.

Obviously the duty of superheater units is far more severe—their normal life has been reduced proportionately as have fireboxes and other boiler parts. It should be realized, therefore, that if fireboxes are renewed oftener—if locomotives are practically rebuilt in about half the time—that superheater units need correspondingly more attention. At general shoppings it is important that superheater units be completely overhauled. Then is the time to have all of them reconditioned—renewed for full capacity and full efficiency—which can be done only—and inexpensively—by the Elesco unit remanufacturing service. It is not enough to repair them—*there is too much at stake.*



THE SUPERHEATER COMPANY

Representative of American Throttle Company, Inc.

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Revenues and Expenses of Railways

MONTH OF JANUARY OF CALENDAR YEAR 1933

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Transportation	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Akron, Canton & Youngstown	Jan.	171	$107,257	$26	$114,143	$11,115	$11,035	$8,855	$37,605	$10,721	$78,645	68.9	$35,498	$24,261	$12,542	$12,850
Alton	Jan.	978	675,915	146,221	935,664	80,471	128,704	50,683	431,480	74,712	778,884	83.2	156,780	46,219	—46,338	—26,736
Alton & Southern	Jan.	31	.....	.....	72,976	5,663	6,956	4,853	28,081	4,921	50,474	69.17	22,502	17,658	12,773	15,863
Atchison, Topeka & Santa Fe	Jan.	9,738	5,342,145	932,635	6,943,344	732,509	1,943,466	312,269	2,876,092	370,865	6,234,920	89.8	708,424	—161,458	—120,422	44,256
Gulf, Colorado & Santa Fe	Jan.	1,955	935,208	46,967	1,045,886	143,285	248,281	49,724	395,304	59,631	896,092	85.7	149,794	63,584	—40,516	—88,975
Panhandle & Santa Fe	Jan.	1,878	551,444	27,622	627,375	69,077	152,095	17,775	207,501	33,192	479,640	76.5	147,735	103,542	22,605	—81,182
Atlanta & West Point	Jan.	93	62,596	17,076	94,940	18,471	24,616	6,653	46,841	7,579	106,258	111.9	—11,318	—19,795	—30,706	—27,275
Western of Alabama	Jan.	133	76,219	18,330	106,390	17,689	30,664	6,925	41,785	7,527	106,334	99.9	56	—7,375	—2,205	—16,750
Atlanta, Birmingham & Coast	Jan.	639	164,873	3,875	195,045	37,252	39,569	17,238	87,314	15,273	206,987	106.1	—11,942	—26,178	—38,856	—118,274
Atlantic Coast Line	Jan.	5,144	2,762,587	505,655	3,630,881	425,077	593,636	133,914	1,227,734	133,215	2,545,389	70.1	1,085,492	684,122	536,116	258,836
Charleston & Western Carolina	Jan.	342	131,022	977	135,220	19,660	19,580	5,911	50,094	4,702	99,947	73.9	35,273	18,706	17,545	—3,290
Baltimore & Ohio	Jan.	6,401	7,885,505	675,176	9,169,022	648,038	1,573,134	338,353	3,437,580	565,146	6,644,365	72.5	2,524,657	1,809,306	1,571,507	1,354,916
Baltimore & Ohio Chic. Term	Jan.	84	.....	.....	249,357	17,193	50,073	1,610	138,333	15,064	227,459	91.2	21,898	—17,132	68,080	88,487
Staten Island Rapid Transit	Jan.	23	52,135	81,753	140,090	6,146	12,385	1,903	78,916	12,622	111,972	79.9	28,118	11,358	—5,624	—8,594
Bangor & Aroostook	Jan.	619	553,525	20,579	593,547	72,083	82,125	4,774	124,383	23,068	307,119	51.7	286,428	231,904	211,659	241,973
Belt Ry. Co. of Chicago	Jan.	54	.....	.....	265,080	14,596	31,623	2,845	139,645	10,369	199,078	75.1	66,002	23,016	152,508	65,762
Bessemer & Lake Erie	Jan.	225	160,159	1,016	168,196	20,391	129,800	10,606	86,238	33,238	280,273	166.6	—112,077	—137,006	—103,049	—176,828
Boston & Maine	Jan.	2,086	2,075,212	586,551	3,159,910	379,844	575,009	60,007	1,360,579	180,891	2,563,317	81.1	596,593	379,479	234,468	410,118
Brooklyn Eastern Dist. Term	Jan.	11	55,565	.....	56,576	5,639	7,238	223	20,967	6,756	40,823	72.2	15,753	9,052	9,052	19,676
Burlington-Rock Island	Jan.	280	69,285	637	73,748	10,602	6,986	3,230	38,576	7,414	66,808	90.6	6,940	1,590	—11,194	—11,896
Cambria & Indiana	Jan.	37	115,159	.....	115,355	5,228	37,739	396	12,470	7,843	63,676	55.20	51,679	32,909	104,958	82,054
Canadian Pac. Lines in Maine	Jan.	233	162,351	15,460	188,685	13,409	36,109	4,399	78,604	3,857	136,378	72.3	52,307	44,307	22,967	37,753
Canadian Pac. Lines in Vermont	Jan.	85	31,815	12,333	57,656	9,070	16,955	1,978	53,207	2,621	83,831	145.3	—26,175	—31,675	—50,855	—33,715
Central of Georgia	Jan.	1,944	650,547	81,067	829,720	100,016	197,920	50,323	392,271	67,993	811,947	97.9	17,773	—78,738	—108,184	—35,151
Central New Jersey	Jan.	691	1,651,462	359,206	2,148,197	158,909	402,743	37,121	893,899	98,261	1,604,007	74.7	544,190	368,217	288,075	216,679
Central Vermont	Jan.	457	274,105	40,051	362,148	46,954	89,153	14,433	183,458	20,377	354,428	97.9	7,720	—7,876	—12,561	—9,478
Chesapeake & Ohio	Jan.	3,144	7,503,360	197,128	7,954,242	924,145	1,571,169	152,967	1,884,428	286,885	4,835,322	60.8	3,118,920	2,362,830	2,335,978	1,951,526
Chicago & Eastern Illinois	Jan.	938	758,836	80,408	923,442	131,006	156,431	53,409	432,375	59,690	839,809	90.9	83,633	—16,531	—139,939	—189,200
Chicago & Illinois Midland	Jan.	131	195,242	1,865	203,702	33,138	53,758	15,490	59,358	14,883	176,687	86.7	27,015	18,004	20,137	47,152
Chicago & North Western	Jan.	8,442	3,611,685	661,207	4,842,641	438,327	1,245,986	147,819	2,277,637	270,239	4,411,587	91.1	431,054	—184,911	—413,676	—273,737
Chicago, Burlington & Quincy	Jan.	9,248	4,145,993	469,689	5,245,152	463,423	939,674	189,726	2,255,684	295,089	4,189,889	79.9	1,055,263	384,707	120,841	635,006
Chicago Great Western	Jan.	1,499	897,620	39,654	1,010,717	153,815	167,592	52,299	450,390	50,188	871,673	86.2	139,044	78,022	—107,305	1,01•
Chicago, Indianapolis & Louisville	Jan.	647	431,701	43,186	534,843	43,910	135,515	23,805	258,702	37,413	504,390	94.3	30,453	—9,564	—90,599	—29,357
Chicago, Mil., St. Paul & Pacific	Jan.	11,242	4,834,920	365,923	5,792,766	543,037	1,344,404	212,377	2,596,526	286,171	5,017,033	86.6	775,733	103,537	—319,468	—209,329
Chicago River & Indiana	Jan.	20	.....	.....	333,134	13,500	20,000	1,670	116,654	11,848	163,672	49.1	169,462	143,261	199,817	225,142
Chicago, Rock Island & Pacific	Jan.	7,611	3,780,398	432,707	4,680,165	440,000	1,046,263	181,545	2,104,569	271,055	4,100,462	87.6	579,703	109,997	—159,560	—161,303
Chicago, Rock Island & Gulf	Jan.	721	269,117	23,354	280,521	33,006	34,953	16,638	106,568	19,535	213,064	76.0	67,457	45,944	—20,927	75,744
Chic., St. Paul, Minn. & Omaha	Jan.	1,736	737,298	102,437	917,873	100,204	158,503	30,976	528,360	64,292	886,630	96.6	31,243	—49,548	—114,618	—148,590
Clinchfield R. R.	Jan.	309	392,534	2,194	400,488	33,046	80,942	15,084	68,424	14,037	211,533	52.8	188,955	133,956	144,219	66,368
Colorado & Southern	Jan.	1,030	304,904	20,990	367,235	33,721	90,485	11,864	168,933	31,703	336,064	91.5	31,171	—25,249	—44,047	3,402
Ft. Worth & Denver City	Jan.	804	318,773	33,072	418,572	24,534	73,632	15,257	135,880	32,522	282,226	67.4	136,346	108,785	90,861	109,324
Columbus & Greenville	Jan.	167	41,608	3,277	49,694	12,225	10,862	2,668	24,998	8,828	59,581	119.9	—9,887	—11,269	—9,945	—16,075
Conemaugh & Black Lick	Jan.	20	10,667	.....	24,346	4,671	6,425	362	13,344	1,047	25,849	106.2	—1,503	—1,803	—630	—5,270
Delaware & Hudson	Jan.	854	1,428,965	94,799	1,623,529	280,343	517,991	45,692	788,651	137,549	1,767,882	108.9	—144,353	—229,598	—204,973	—129,662
Delaware, Lackawanna & Western	Jan.	998	2,230,632	537,635	3,240,979	241,059	742,659	112,213	1,599,880	158,125	2,878,945	88.8	362,034	—38,147	—53,778	251,375
Denver & Rio Grande Western	Jan.	2,513	1,055,930	54,947	1,181,135	119,039	252,552	46,356	430,160	76,234	927,878	78.6	253,257	103,218	129,497	110,700
Denver & Salt Lake	Jan.	232	93,397	4,939	108,446	15,024	21,431	1,559	23,662	11,411	73,087	67.4	35,359	21,125	25,181	124,300
Detroit & Mackinac	Jan.	242	27,227	2,430	34,284	7,392	6,910	1,146	22,616	3,574	41,638	121.5	—7,354	—13,187	—13,766	—9,074
Detroit & Toledo Shore Line	Jan.	50	248,286	.....	250,032	13,745	19,745	6,376	57,459	7,647	104,792	42.0	145,060	119,207	75,352	70,578
Detroit Terminal	Jan.	19	.....	.....	62,267	3,968	7,693	.....	27,214	2,576	41,451	79.3	10,816	—936	—5,712	—6,015
Detroit, Toledo & Ironton	Jan.	472	327,282	272	336,331	22,934	53,584	8,891	93,320	20,803	198,554	59.0	137,777	95,863	71,505	24,736
Duluth, Missabe & Northern	Jan.	563	40,423	1,056	54,062	71,334	139,668	3,230	111,478	40,326	366,036	677.1	—311,974	—317,244	—319,827	—405,855
Duluth, Winnipeg & Pacific	Jan.	178	49,264	1,614	54,113	16,478	21,752	2,238	34,302	4,062	78,816	145.7	—24,703	—27,469	—6,955	9,404
Elgin, Joliet & Eastern	Jan.	447	543,988	.....	581,984	66,062	147,895	12,040	260,124	50,768	536,887	92.3	45,097	—55,595	—89,196	—94,915

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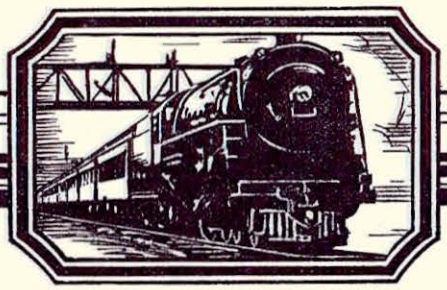

Alco Alco

A Prominent Industrialist Once Said—

"If there is a machine that can effect a given saving in any operation, you are paying a tax equal to the amount of that saving all the while you delay installing that machine."

IT is a matter of record that industrial and public utility plants often replace apparently new machines long before the luster of the paint is tarnished. Why? Simply because they are obsolete and can be replaced by machines of greater capacity and efficiency. That's good business because the loss on obsolete machines costs more than replacement with modern machinery.

Modern locomotives will pay. Experience proves it. A notable example is the 38 per cent return on the twenty new Lehigh Valley locomotives running between the Niagara frontier and Jersey City.

To Economize—Modernize

American Locomotive Company

30 Church Street New York N.Y.

Alco Alco

Revenues and Expenses of Railways

MONTH OF JANUARY OR CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Erie Railroad	Jan.	2,046	$3,795,662	$444,024	$4,637,807	$396,501	$1,027,743	$129,960	$1,868,267	$235,592	$3,670,090	79.1	$967,717	$617,089	$513,828	$412,827
Chicago & Erie	Jan.	269	636,606	16,646	693,245	57,400	110,173	22,369	195,025	32,852	417,604	60.2	275,641	239,831	37,048	—45,868
New Jersey & New York	Jan.	45	14,441	72,987	89,085	8,283	23,954	1,331	51,349	3,238	88,155	99.0	930	—4,083	—25,405	—29,695
N. Y., Susquehanna & Western	Jan.	131	213,782	29,529	256,268	26,428	50,482	4,312	113,024	10,149	204,395	79.8	51,873	21,573	8,695	—7,109
Florida East Coast	Jan.	839	514,992	174,130	769,519	101,288	140,085	21,366	194,528	39,346	504,040	65.5	265,479	190,276	154,116	173,276
Fort Smith & Western	Jan.	249	49,120	892	54,738	12,356	11,318	4,486	19,675	4,541	52,526	96.0	2,212	—390	—1,389	3,640
Galveston Wharf	Jan.	11	.....	.....	90,181	34,364	4,057	3,443	19,670	8,773	74,725	82.9	15,456	—4,554	—4,504	48,510
Georgia R. R.	Jan.	329	205,143	12,811	237,090	26,664	45,923	16,639	106,075	13,296	208,969	88.1	28,121	22,025	29,330	—26,615
Georgia & Florida	Jan.	463	50,577	905	55,906	15,113	12,195	8,429	30,179	6,686	72,785	130.2	—16,879	—21,879	—25,441	—26,275
Grand Trunk Western	Jan.	1,002	1,054,834	56,608	1,212,364	141,308	277,368	34,521	547,549	75,547	1,079,482	89.0	132,882	30,869	—78,274	—204,683
Canadian Nat'l Lines in New Eng.	Jan.	172	70,388	9,353	92,150	20,568	16,863	2,922	57,889	9,254	109,989	119.4	—17,839	—31,969	—67,486	—96,203
Great Northern	Jan.	8,457	2,925,789	254,811	3,581,681	403,511	927,158	157,916	1,666,128	196,064	3,367,152	94.0	214,529	—323,730	—516,413	—735,155
Green Bay & Western	Jan.	234	79,280	944	82,294	15,487	10,822	4,679	40,031	2,553	73,572	89.4	8,722	2,722	836	—6,869
Gulf & Ship Island	Jan.	307	73,545	6,911	88,725	10,101	21,581	2,226	43,073	4,366	82,011	92.4	6,714	—11,071	—22,626	—37,569
Gulf, Mobile & Northern	Jan.	733	213,771	8,205	236,672	34,423	34,688	20,787	93,732	17,633	201,263	85.04	35,409	14,400	—7,523	—38,839
Illinois Central	Jan.	5,014	4,699,231	579,595	5,709,781	376,371	1,342,809	176,301	2,254,454	340,482	4,521,116	79.2	1,188,665	693,415	582,930	636,675
Yazoo & Mississippi Valley	Jan.	1,673	808,311	55,746	933,600	63,473	143,359	22,767	400,566	47,952	678,949	72.7	254,651	124,446	27,379	22,829
Illinois Central System	Jan.	6,687	5,507,542	635,341	6,643,381	439,844	1,486,168	199,068	2,655,020	388,434	5,200,065	78.3	1,443,316	817,861	610,309	659,504
Illinois Terminal	Jan.	545	280,101	48,759	340,354	35,793	53,198	14,372	143,137	13,678	260,178	76.44	80,176	56,580	29,866	61,259
Kansas City Southern	Jan.	783	566,167	13,813	655,881	66,360	119,476	38,804	225,723	56,083	507,825	77.4	148,056	71,438	60,391	163,858
Texarkana & Ft. Smith	Jan.	98	62,396	908	71,907	8,634	4,512	5,353	25,987	7,790	53,261	74.1	18,646	11,034	—4,556	—9,558
Kansas, Oklahoma & Gulf	Jan.	326	138,351	351	141,291	8,755	13,467	6,828	34,191	7,907	70,917	50.2	70,374	55,661	42,800	46,252
Lake Superior & Ishpeming	Jan.	160	23,878	91	25,573	13,468	12,745	496	15,491	5,456	47,656	186.4	—22,083	—34,600	—35,682	—47,543
Lake Terminal	Jan.	12	.....	.....	23,984	1,707	3,955	.....	13,579	2,518	21,759	90.7	2,225	—608	—1,314	—6,424
Lehigh & Hudson River	Jan.	96	105,258	210	113,345	8,936	18,814	3,099	41,273	6,169	78,291	69.1	35,054	22,864	11,659	12,104
Lehigh & New England	Jan.	228	212,440	411	214,779	22,690	61,251	5,089	112,251	16,992	218,273	101.6	—3,494	—9,649	—2,664	56,006
Lehigh Valley	Jan.	1,362	2,376,372	176,765	2,790,949	201,301	704,914	109,691	1,337,033	129,110	2,496,501	89.4	294,448	28,893	—78,556	—55,112
Louisiana & Arkansas	Jan.	608	275,423	7,959	307,785	32,830	51,352	18,555	80,709	16,172	198,301	64.4	109,484	79,137	71,239	67,998
Louisiana, Arkansas & Texas	Jan.	225	60,683	334	65,976	16,508	9,208	3,358	26,100	4,258	59,432	90.1	6,544	4,801	—7,628	—8,477
Louisville & Nashville	Jan.	5,166	4,362,460	381,060	5,149,326	545,353	1,084,709	173,193	1,881,929	255,650	3,969,858	77.1	1,179,468	800,545	850,494	79,838
Maine Central	Jan.	1,117	620,865	75,286	771,995	111,003	131,599	9,657	343,132	38,235	633,455	82.1	138,540	91,709	58,250	—19,754
Midland Valley	Jan.	363	102,151	768	107,131	11,784	7,648	2,426	31,624	7,599	61,081	57.0	46,050	36,450	28,000	36,227
Minneapolis & St. Louis	Jan.	1,627	483,122	13,950	534,060	45,440	147,885	29,799	299,460	38,544	559,553	104.8	—25,493	—69,809	—89,417	—81,667
Minn., St. Paul & S. S. Marie	Jan.	4,337	1,194,404	77,592	1,393,570	214,602	359,592	61,581	738,462	109,706	1,487,041	106.7	—93,471	—260,743	—395,635	—480,878
Duluth, South Shore & Atlantic	Jan.	559	101,598	12,498	125,543	15,125	31,297	6,696	69,371	6,526	130,074	103.6	—4,531	—33,643	—29,730	—63,103
Spokane International	Jan.	163	21,570	1,454	26,633	8,679	3,923	2,567	19,174	4,056	38,399	144.2	—11,766	—16,605	—18,376	—14,045
Mississippi Central	Jan.	150	37,263	1,068	40,081	5,173	8,798	6,311	15,676	5,343	41,301	103.0	—1,220	—3,916	—7,566	—10,703
Missouri & North Arkansas	Jan.	364	45,477	1,114	52,004	16,092	8,686	6,491	25,578	5,873	62,720	120.6	—10,716	—13,200	—19,770	—7,973
Missouri-Illinois	Jan.	202	66,034	451	67,974	14,071	14,970	2,443	22,541	5,296	59,267	87.2	8,707	3,352	—3,267	—3,911
Missouri-Kansas-Texas Lines	Jan.	3,293	1,468,662	172,801	1,837,808	270,576	294,370	119,124	762,463	136,759	1,596,404	86.9	241,404	35,156	—131,272	177,886
Missouri Pacific	Jan.	7,412	4,240,685	325,203	5,019,824	457,943	1,012,968	213,361	2,060,341	273,139	4,019,984	80.1	999,840	611,165	321,098	320,229
Gulf Coast Lines	Jan.	1,030	618,045	29,474	684,075	59,914	107,677	31,956	192,307	40,719	425,666	62.23	258,409	218,988	156,768	151,953
International-Great Northern	Jan.	1,159	699,500	52,969	833,994	91,883	137,404	27,342	340,483	45,451	650,763	78.03	183,231	146,070	61,745	—63,400
San Antonio, Uvalde & Gulf	Jan.	316	63,112	3,899	71,371	14,447	10,180	3,943	21,409	4,407	54,142	75.9	17,229	13,300	—11,440	3,197
Mobile & Ohio	Jan.	1,239	488,815	18,492	540,849	91,237	127,760	39,106	249,553	37,159	545,977	100.9	—5,128	—44,955	—95,988	—128,315
Monongahela	Jan.	177	250,099	806	252,972	15,777	20,819	973	57,615	9,117	104,319	41.2	148,653	142,048	74,477	66,924
Monongahela Connecting	Jan.	6	.....	.....	32,899	9,747	14,035	45	26,750	2,575	53,152	161.6	—20,253	—25,047	—24,386	—25,278
Montour	Jan.	57	106,835	.....	108,675	7,738	28,037	1,148	28,531	8,165	73,619	67.7	35,056	32,325	54,160	44,738
Nashville, Chattanooga & St. Louis	Jan.	1,203	764,575	71,107	955,937	128,445	195,994	57,566	392,466	57,030	837,541	87.6	118,396	85,296	73,689	159
Nevada Northern	Jan.	165	17,897	1,628	23,363	9,646	4,365	793	8,477	3,326	26,607	113.9	—3,244	—11,091	—6,978	—4,713
Newburgh & South Shore	Jan.	6	.....	.....	46,277	3,804	18,870	.....	24,858	5,123	52,655	113.8	—6,378	—15,135	—14,930	—24,738
New Orleans Great Northern	Jan.	262	115,322	6,123	125,154	10,604	15,566	11,695	41,712	6,836	86,413	69.0	38,741	28,841	7,046	15,202
New Orleans Terminal	Jan.	20	400	.....	122,222	5,921	5,846	.....	26,700	967	39,434	32.3	82,788	70,857	46,914	22,675
New York Central	Jan.	11,495	14,931,974	4,347,517	21,978,923	1,932,059	4,381,843	457,521	8,604,888	1,041,501	16,743,299	76.2	5,235,624	2,677,238	1,455,828	1,207,144

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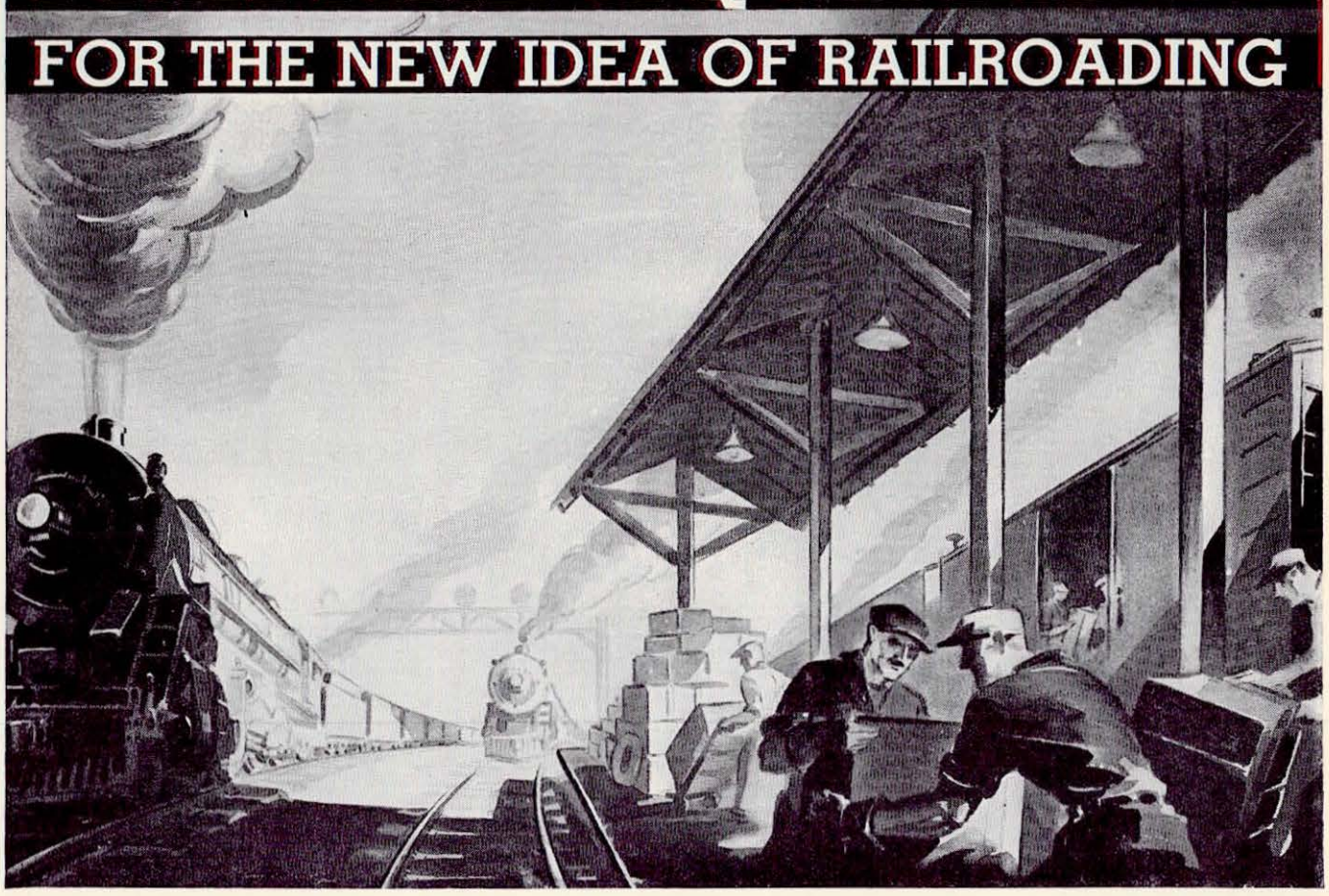
PREPARE EQUIPMENT

FOR THE NEW IDEA OF RAILROADING



Railroads have a new idea of transportation. Freight is kept on the move. Hours and in some cases days have been cut from schedules. The railroads are attempting, through better service, to regain their lost traffic. « For equipment, this speeding up has resulted in increased stress, higher maintenance and a demand for greater dependability. « The old materials are no longer adequate. New steels are needed to meet the greater stresses, to lower repair costs and to increase dependability. « Republic metallurgists have been aware of the changed conditions and have developed suitable Agathon Steels for the new requirements. « Alloy steel piston rods, pins, axles, firebox sheets, staybolts, engine bolts, motion work and other vital parts can meet the increased strain of increased power because they are modern alloy materials—many of them developed specially by Republic for railroad work. « When you have a materials problem involving iron or steel consult Republic.

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C E N T R A L A L L O Y D I V I S I O N

REPUBLIC STEEL
CORPORATION
MASSILLON OHIO

ACATHON STEELS

Revenues and Expenses of Railways

MONTH OF JANUARY OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Indiana Harbor Belt	Jan.	120	.....	.....	$557,608	$43,500	$45,000	$3,135	$231,844	$19,932	$353,795	63.4	$203,813	$163,314	$103,808	$98,066
Pittsburgh & Lake Erie	Jan.	235	$831,951	$45,585	905,573	71,925	276,869	23,866	364,421	58,577	797,091	88.0	108,482	20,850	140,603	135,469
New York, Chicago & St. Louis	Jan.	1,691	2,053,695	60,675	2,195,558	171,290	413,321	100,600	849,412	116,647	1,650,790	75.2	544,768	367,843	132,841	59,716
N. Y., New Haven & Hartford	Jan.	2,068	2,781,484	1,810,301	5,247,940	624,203	864,622	74,368	2,122,058	246,930	4,058,945	77.3	1,188,995	813,884	361,203	928,715
New York Connecting	Jan.	20	240,169	.....	246,835	8,862	7,453	.....	31,823	857	48,995	19.8	197,840	163,560	114,239	77,394
New York, Ontario & Western	Jan.	568	696,440	13,676	808,740	67,762	137,941	12,020	323,758	24,021	569,023	70.4	239,717	194,663	151,912	82,056
Norfolk & Western	Jan.	2,233	4,952,231	116,107	5,227,971	494,234	984,648	108,592	1,284,316	223,284	3,110,087	59.5	2,117,884	1,467,085	1,594,711	743,065
Norfolk Southern	Jan.	932	250,829	5,544	270,887	72,839	63,964	19,785	141,226	24,497	322,311	119.0	—51,424	—89,557	—98,910	—75,016
Northern Pacific	Jan.	6,735	2,359,869	208,194	2,872,104	254,531	926,386	135,509	1,428,564	259,166	3,055,490	106.4	—183,386	—700,386	—432,379	—555,257
Northwestern Pacific	Jan.	441	80,162	67,053	174,770	),667	44,942	4,390	126,727	14,435	229,220	131.2	—54,450	—76,952	—87,044	—103,911
Oklahoma City-Ada-Atoka	Jan.	132	25,136	335	27,084	3,440	1,254	720	10,389	1,491	17,294	63.9	9,790	6,087	349	—4,214
Pennsylvania Railroad	Jan.	10,892	17,284,027	4,442,988	24,242,155	1 31,316	4,788,026	528,537	9,395,039	1,285,738	18,249,234	75.3	5,992,921	4,198,501	3,247,345	3,295,647
Long Island	Jan.	399	455,945	1,382,316	1,951,647	152,561	280,805	10,587	867,243	56,750	1,367,950	70.1	583,697	468,562	297,045	206,381
Peoria & Pekin Union	Jan.	18	9,574	.....	65,579	7,336	7,235	1,725	31,662	6,941	54,899	83.7	10,679	—3,359	15,580	14,636
Pere Marquette	Jan.	2,320	1,631,045	48,457	1,766,846	235,593	427,514	56,440	702,261	94,938	1,520,464	86.1	246,382	97,745	—37,515	—30,866
Pittsburg & Shawmut	Jan.	102	48,588	693	50,030	9,222	17,518	1,229	15,659	6,177	49,805	99.6	225	—275	334	1,484
Pittsburgh & West Virginia	Jan.	138	146,124	42	158,491	15,737	47,713	11,909	34,974	12,660	129,953	82.0	28,538	4,933	22,026	19,896
Pittsburg, Shawmut & Northern	Jan.	197	73,088	166	76,342	11,049	17,789	1,270	28,734	7,230	66,072	86.5	10,270	8,044	3,172	2,366
Reading	Jan.	1,461	3,372,633	250,887	3,864,843	211,192	929,676	71,557	1,530,714	197,525	2,956,794	76.5	908,049	701,611	652,008	469,927
Atlantic City	Jan.	168	68,467	33,034	109,663	19,874	15,227	1,936	109,013	3,970	150,305	137.1	—40,642	—78,542	—85,664	—118,485
Richmond, Fredericksburg & Potomac	Jan.	117	309,667	150,012	560,744	40,840	97,972	7,779	222,675	31,457	409,645	73.1	151,099	119,633	65,705	49,818
Rutland	Jan.	413	147,692	41,184	244,557	38,126	62,395	9,639	123,906	14,235	248,307	101.5	—3,750	—23,936	—13,119	—17,244
St. Louis-San Francisco	Jan.	5,266	2,501,058	198,278	2,950,993	464,281	731,114	96,189	1,102,363	141,298	2,547,884	86.3	403,109	65,493	15,792	70,866
Ft. Worth & Rio Grande	Jan.	233	26,983	1,095	33,064	18,683	11,380	2,280	21,153	3,663	57,159	172.9	—24,095	—28,970	—35,517	—35,399
St. Louis, San Francisco & Texas	Jan.	262	73,360	518	76,172	27,381	18,765	4,918	34,250	7,527	92,842	121.9	—16,670	—20,651	—45,641	—65,998
St. Louis Southwestern Lines	Jan.	1,914	931,255	18,065	994,311	105,080	148,482	75,924	366,762	72,195	773,734	77.8	220,577	138,690	53,330	—66,008
San Diego & Arizona	Jan.	155	33,257	5,758	39,906	10,905	8,869	2,021	17,991	4,495	44,739	112.1	—4,833	—8,085	—8,230	1,655
Seaboard Air Line	Jan.	4,385	2,372,602	278,368	2,917,228	437,391	575,480	135,800	1,036,795	128,795	2,346,733	80.4	570,495	370,051	197,835	12,415
Southern Ry.	Jan.	6,653	4,985,280	557,979	6,051,288	640,830	1,302,568	155,995	2,257,286	242,543	4,609,284	76.2	1,442,004	943,802	801,949	24,225
Alabama Great Southern	Jan.	315	237,591	30,130	292,449	53,541	88,198	10,793	115,725	14,554	284,845	97.4	7,604	—27,069	—41,135	—61,289
Cinn., New Orleans & Texas Pacific	Jan.	337	710,242	62,565	823,977	91,169	200,172	20,144	229,829	36,099	581,412	70.6	242,565	186,423	200,380	79,993
Georgia Southern & Florida	Jan.	397	99,290	26,956	143,400	23,404	38,737	1,617	45,135	2,283	113,729	79.3	29,671	14,720	16,711	—2,623
New Orleans & Northeastern	Jan.	204	93,316	13,167	117,048	17,446	43,034	5,947	56,813	8,914	133,544	114.1	—16,496	—47,469	—62,616	—36,134
Northern Alabama	Jan.	99	41,384	880	43,710	7,145	1,250	1,126	14,321	1,733	25,575	58.5	18,135	13,666	—1,039	—9,962
Southern Pacific	Jan.	9,101	4,612,893	1,256,131	6,564,593	819,734	1,419,867	265,503	2,872,036	564,370	6,104,429	93.0	460,164	—508,979	—766,849	—33,171
So. Pac. Steamship Lines	Jan.	...	254,790	10,929	278,615	12,831	100,458	15,863	230,825	21,525	381,502	136.9	—102,887	—106,936	—107,068	—118,543
Texas & New Orleans	Jan.	4,582	1,770,107	195,725	2,224,881	341,287	502,634	114,478	869,523	223,316	2,060,228	92.6	164,653	—75,535	—242,355	—251,901
Spokane, Portland & Seattle	Jan.	552	205,337	21,404	259,339	31,016	51,855	7,681	121,635	20,899	234,038	90.2	25,301	—51,326	—56,986	62
Tennessee Central	Jan.	295	159,876	3,910	173,919	24,128	24,769	5,445	56,486	10,390	121,199	69.7	52,720	47,925	29,553	19,094
Term. R. R. Assn. of St. Louis	Jan.	55	.....	.....	423,817	57,567	30,817	3,334	219,714	17,882	332,186	78.4	91,631	2,963	68,162	119,081
Texas & Pacific	Jan.	1,950	1,200,487	150,453	1,537,918	172,313	298,441	62,760	516,057	106,147	1,169,868	76.1	368,050	264,822	148,917	240,064
Texas Mexican	Jan.	162	55,147	734	61,311	7,550	12,060	3,059	24,606	6,631	53,321	87.0	7,990	3,501	582	—8,986
Toledo, Peoria & Western	Jan.	239	105,054	28	106,441	25,044	8,996	14,354	30,882	7,196	86,472	81.2	19,969	16,369	8,426	631
Toledo Terminal	Jan.	28	.....	.....	72,072	4,056	9,610	468	33,449	4,263	51,846	71.9	20,226	12,225	23,660	26,023
Union R. R. of Penna	Jan.	45	.....	.....	124,483	25,970	89,482	131	73,746	15,289	204,618	164.4	—80,135	—86,639	—77,700	—65,734
Union Pacific	Jan.	3,767	3,147,568	355,109	3,888,729	227,076	941,387	103,221	1,423,723	285,832	3,040,082	78.2	848,647	528,168	399,953	615,355
Oregon Short Line	Jan.	2,504	1,156,705	95,297	1,390,589	115,390	225,337	35,834	530,997	93,387	1,048,917	75.4	341,672	101,511	18,491	120,401
Oregon-Wash. R. R. & Nav. Co.	Jan.	2,316	621,838	70,619	790,529	116,270	151,710	50,264	431,557	86,882	842,058	106.5	—51,529	—179,726	—288,241	—203,827
Los Angeles & Salt Lake	Jan.	1,249	903,999	105,893	1,097,636	116,135	192,084	42,617	380,576	60,410	817,007	74.4	280,629	168,568	46,498	65,020
St. Joseph & Grand Island	Jan.	258	153,637	1,708	162,845	12,525	20,249	2,165	59,194	12,615	106,748	65.6	56,097	45,782	26,647	29,828
Utah	Jan.	111	133,804	.....	134,986	15,065	25,038	509	28,117	5,170	73,899	54.7	61,087	47,447	32,775	37,375
Virginian	Jan.	608	1,130,035	5,378	1,189,140	105,859	197,145	15,877	220,075	29,772	568,593	47.8	620,547	460,547	536,452	465,033
Wabash	Jan.	2,480	2,282,952	171,759	2,650,160	346,421	510,653	136,869	1,210,937	133,445	2,346,462	88.5	303,698	99,452	—229,466	—367,212
Ann Arbor	Jan.	293	198,562	2,081	206,933	26,287	40,909	11,264	107,004	10,290	195,764	94.6	11,169	—7,713	—21,111	—19,226
Western Maryland	Jan.	891	914,103	6,631	945,679	102,756	182,149	31,677	252,889	36,890	609,054	64.4	336,625	266,625	273,051	311,528
Western Pacific	Jan.	1,210	585,758	10,083	614,381	88,380	145,592	55,849	312,722	36,238	648,382	105.5	—34,001	—113,087	—105,243	—119,387
Wheeling & Lake Erie	Jan.	511	632,688	1,915	674,681	62,043	193,213	26,918	216,492	26,418	525,084	77.8	149,597	73,377	50,252	7,064
Wichita Falls & Southern	Jan.	203	36,338	30	38,069	7,876	6,483	1,638	12,598	2,937	31,532	82.83	6,537	3,827	1,024	—5,970

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Constant research,
Full understanding of operating problems, and
Development of the most effective treating materials for the individual case.

These are the reasons for making analyses of water supplies in Dearborn Laboratories and a study of operating conditions before submitting recommendations. These are the reasons for the constant laboratory control in checking boiler conditions.

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When Diesel engine jackets, water lines, boilers, heaters, condensers and general water handling equipment build up scale, under conditions where it is not practical to treat the water, the scale should be removed periodically to maintain efficiency and capacity. For fast, thorough removal of carbonate scale, Dearborn Special Formula No. 134 is unsurpassed. It may be used, mixed with water, as a spray in locomotive boilers that have scale deposits. It is surprising the amount of scale a few minutes spraying removes. Recommendations submitted gladly.

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Reproduced from the Railway Age May 26, 1928

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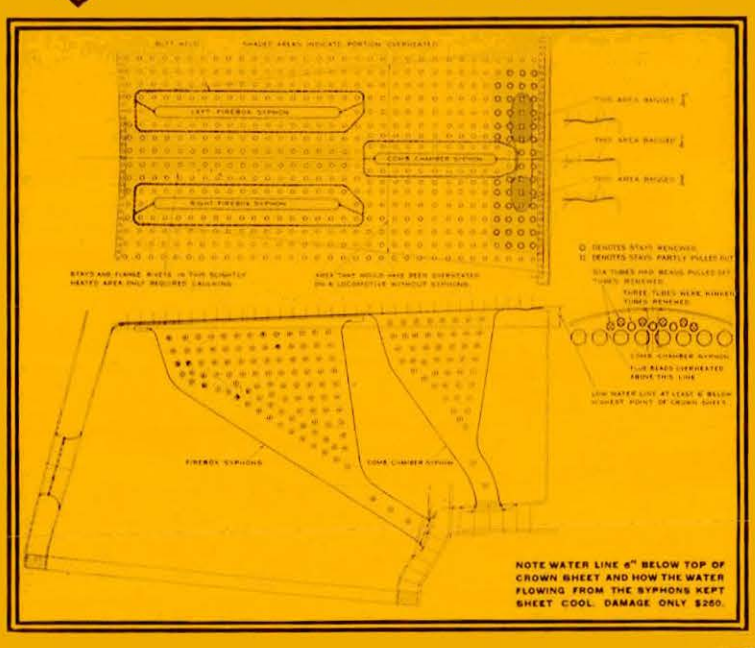
FOR COMPLETE SAFETY THE COMBUSTION CHAMBER MUST HAVE ITS OWN SYPHON PROTECTION



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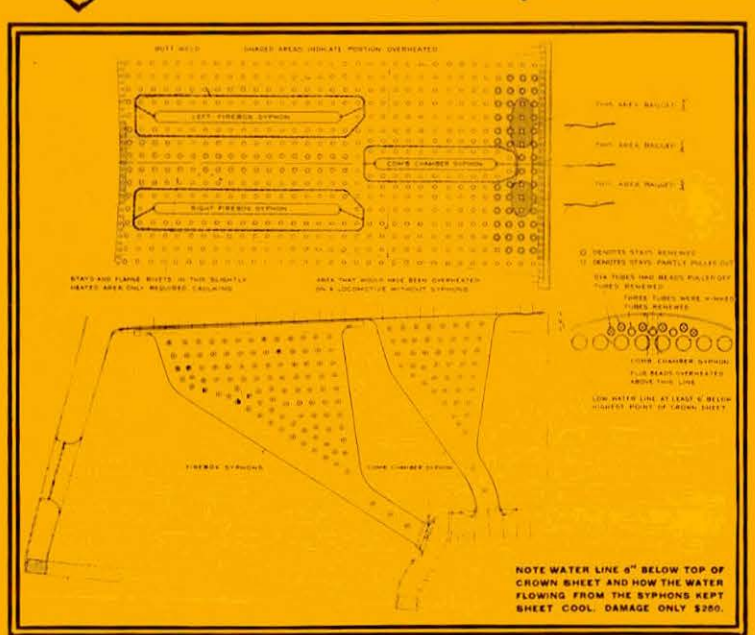

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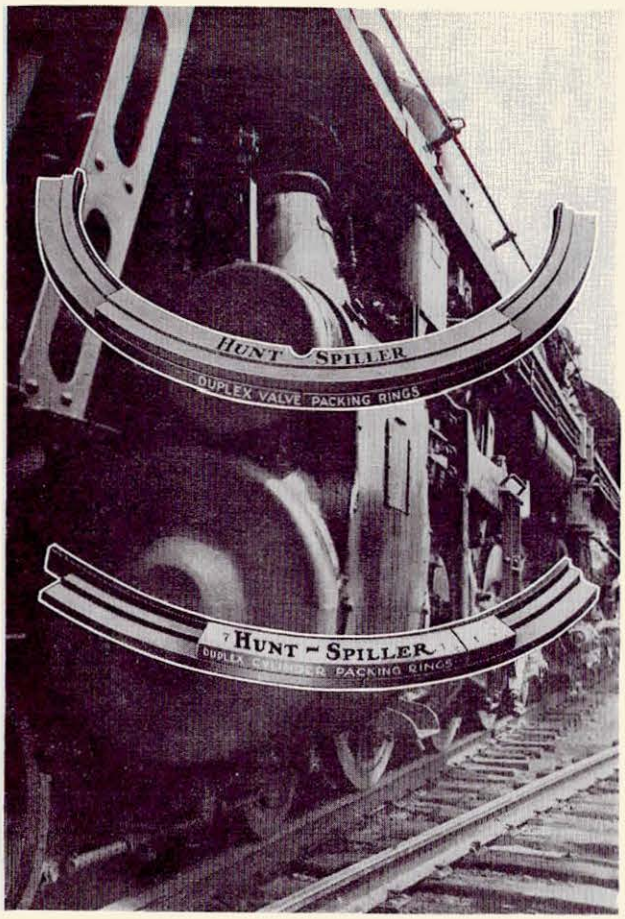

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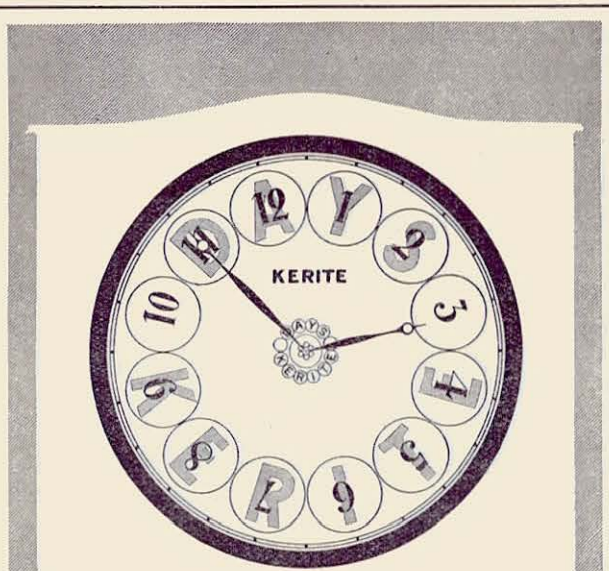

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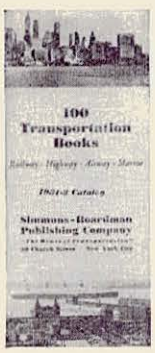

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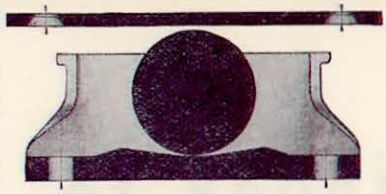

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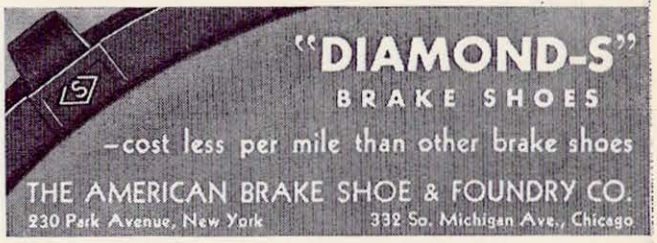
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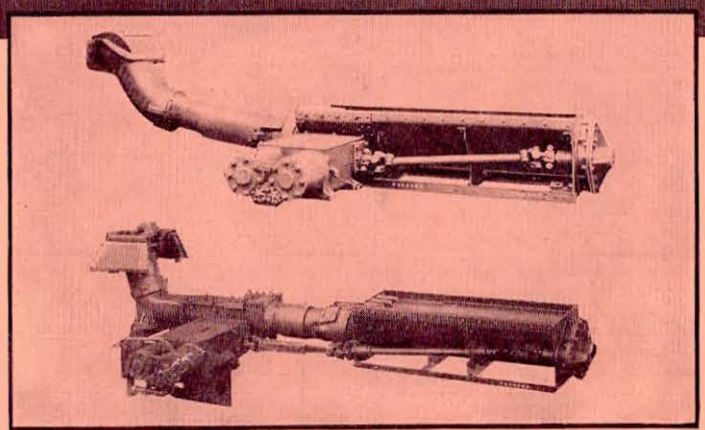

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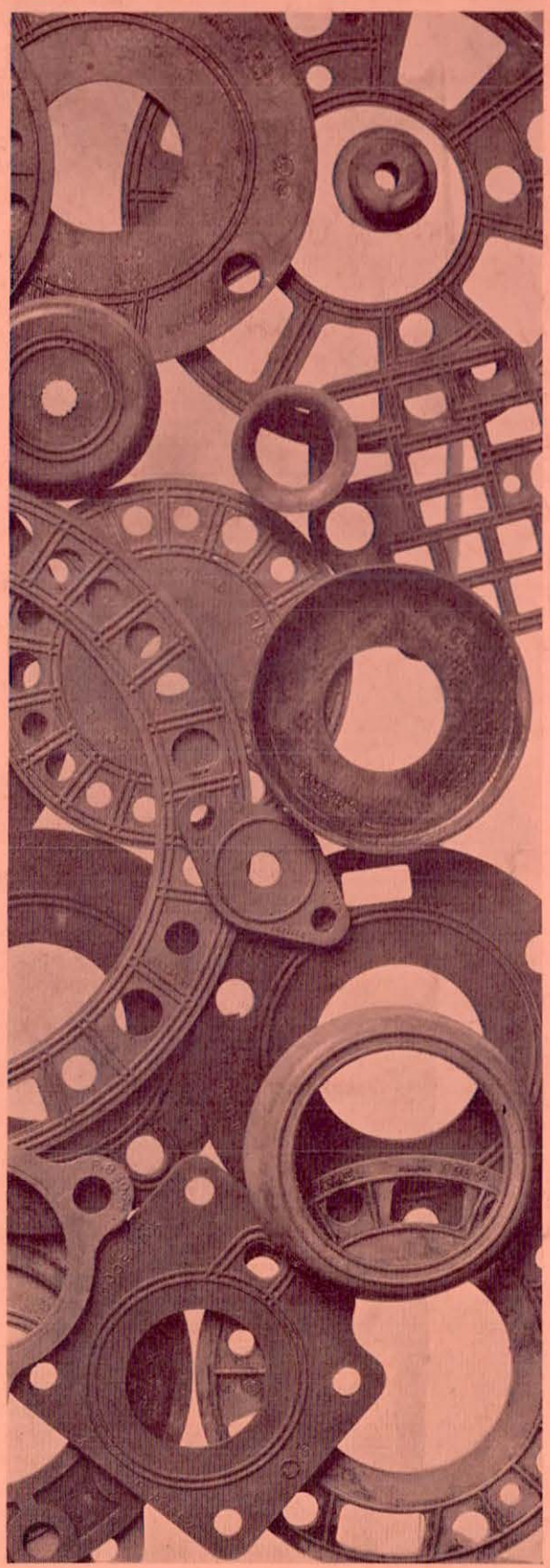

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